# Mastering the 250 Reference Manual

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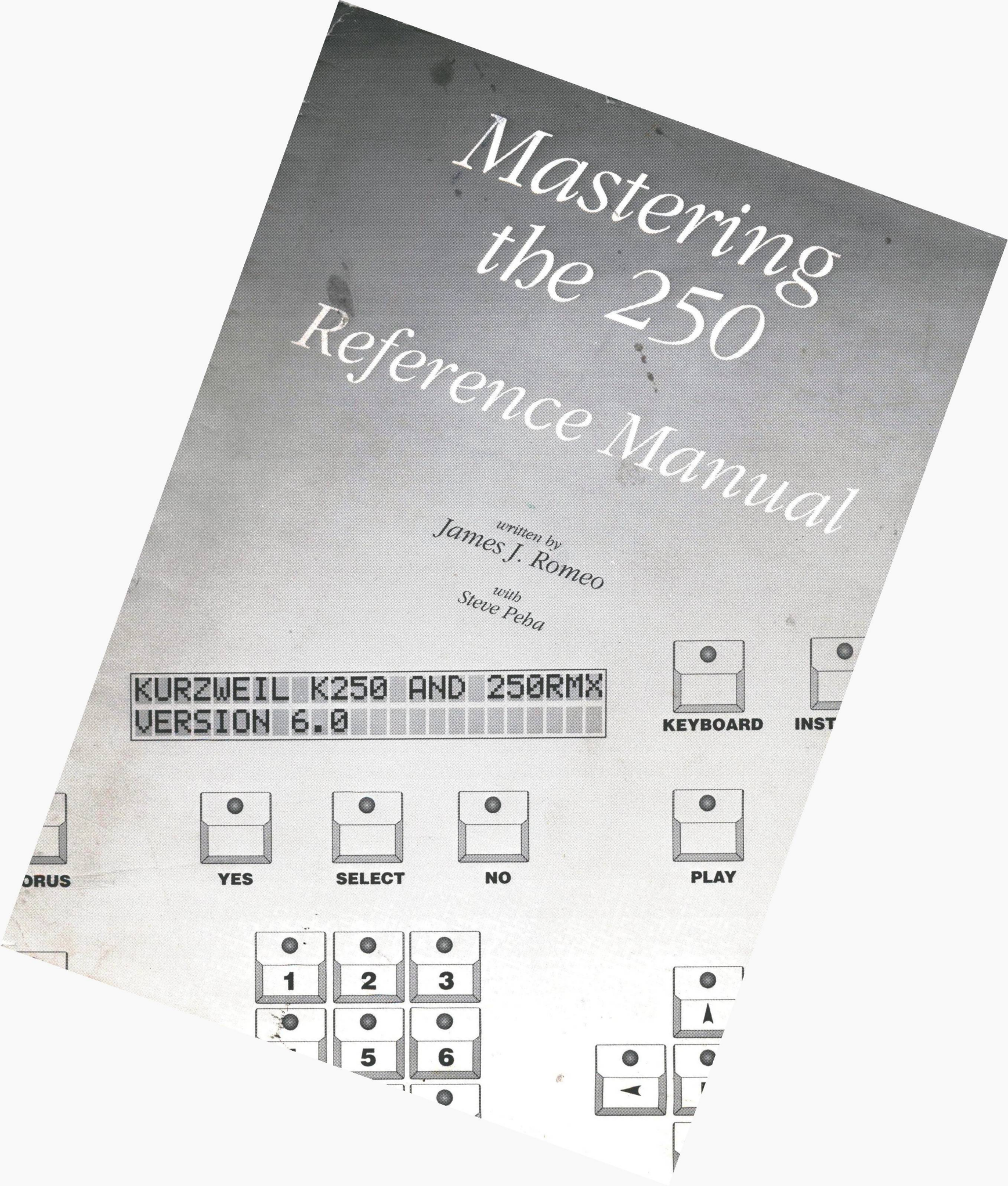

# *Mastering the 250*

## *Reference Manual*

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**TRADEMARKS**



**PRODUCTION**

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# Contents

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# *Preface:*

# *An Overview of the Reference Manual*

*Preface*

# An Overview of the Reference Manual

## INTRODUCTION

*Each chapter is layed out in 3 sections: introduction, main menu items, and a comprehensive reference guide.*

Welcome to the 250 Version 6.0 Reference Manual! At this point you have probably read the User's Guide and so already know how to perform the basic operations on the 250. This second volume goes into much greater detail, with an explanation of every feature of the 250. The Reference Manual includes outlines which list and explain all of the options in the 250's user interface, as well as descriptions of the 250's hardware, and appendices containing additional information for 250 owners. Volume Two is intended not necessarily as a book to be read cover to cover, but as a source to which you can refer for information on how to perform certain functions, for help in unfamiliar procedures, or for detailed explanations of features and concepts.

## WHAT IS IN THIS REFERENCE MANUAL

This Reference Manual is divided into nine chapters and two appendices.

*Part One*

### Chapter 1

The first chapter, **The 250 Front and Back**, is a discussion of the hardware features of the 250. Here is a detailed explanation of the back panel (input and output), and the top panel (faders, buttons, wheels, display).

**Chapter 2**
**Getting Around: The 250 User Interface** is devoted to guiding you through the overall organization of the user interface.

Next you'll find seven chapters, each devoted to an in-depth treatment of an editor function.

*Part Two*

**Chapter 3**
**The Play Editors**. This chapter covers all aspects of the Play Editors. Included are: the list editor, bins editor, transpose, chorus, assignable controllers, and the cartridge menus.

**Chapter 4**
**The Function Editor**. This chapter covers all aspects of the Function Editor, including channel stealing, maintenance, and more.

**Chapter 5**
**The Keyboard Editor**. This chapter covers all aspects of the Keyboard Editor, including splits, layers, dynamics, and more.

**Chapter 6**
**The Instrument Voicing Editor**. This chapter covers all aspects of the Instrument Voicing Editor, including vibrato, tremolo, the Envelope Editor sub-section, and more.

**Chapter 7**
**The MIDI Editor**. This chapter covers all aspects of the MIDI Editor, including Transmit and Receive options, as well as basic channel, reverse velocity, and factory defaults.

**Chapter 8**
**The 250 Sequencer**. This chapter covers all aspects of the 250's powerful built-in sequencer.

**Chapter 9**
**Sampling on the 250**. This chapter covers all aspects of the 250's Sound Modeling Program, including advanced concepts, and a special section entitled *Tips From the Master*, written by Joe Ierardi, creator of many of the Kurzweil ROM sounds.

*Part Three*

**Appendix A**
**For Pre-Version 6.0 Owners Only**. This Appendix discusses the

differences between 250 software version 6.0 and previous versions.

*QLS is a software program that can be used for storing Keyboards, Instruments, Soundfiles, and more.*

**Appendix B**
**Other Software with the 250**. This Appendix discusses other hardware and software available for use with the 250, especially focusing on QLS, the Quick Load System, available for making a useful and efficient combination of your 250 and Macintosh.

## CONCLUSION

As you can see, the emphasis in Volume Two is on an exhaustive presentation of every feature the 250 offers. This is where you will find the answers to your specific questions. It will also prove useful to browse through those sections of the Reference Manual dealing with features of particular interest to you. This volume is the key to the hundreds of sophisticated features the 250 offers.

Enjoy!

James J. Romeo
1988

# *The 250 Front and Back*

# 1

*Chapter One*

# *The 250 Front and Back*

## OVERVIEW

This chapter provides a detailed description of every button, switch, pedal, plug, and lever on the 250.

*The Back of the 250*

## THE COMPUTER INTERFACE

The COMPUTER INTERFACE is a parallel communications port that is used to send data back and forth between the 250 and a personal computer. The computer currently supported is the Macintosh computer made by Apple. All current models are supported (512K, 512KE, Plus, SE, and II) with the exception of the original 128K Mac. When used with the Macintosh this functions as a serial communications port. The software used with the Mac is called QLS—Quick Load System. For more information on QLS see the appropriate chapter in *Appendix B* of this volume.

## THE TRIGGER IN JACK

The TRIGGER IN jack is a 1/4" phone jack input that is used for triggering recording and playing in the 250 sequencer. A foot pedal (or any analog signal) can be connected to this jack and assigned (in the Sequence Editor) to trigger recording or playback. This leaves your hands free to play at the keyboard.

## THE CLICK OUT JACK

The CLICK OUT jack is a 1/4" phone jack that generates a steady 5-volt (positive) pulse that you can use as a metronome when recording and playing back tracks in the 250 sequencer. The 250 will send out a click at the tempo set in the currrent sequence.

## THE SYNC IN JACK

The SYNC IN jack is a 1/4" phone jack that is used for synchronizing the 250 to a multi-track tape recorder. The 250 generates a sync tone from the SYNC OUT jack. This tone can be recorded on one track of a multi-track tape recorder and read by the 250 through the SYNC IN jack to sync the 250's sequenccer with other tracks on the tape machine.

## THE SYNC OUT JACK

*The 250's sync tone works similarly to a drum machine FSK signal.*

The SYNC OUT jack is a 1/4" phone jack that generates a 5-volt square wave that is used for synchronizing the 250 to a multi-track tape machine. The SYNC OUT jack generates a tone that can later be read by the 250 through the SYNC IN jack. The default setting for the sync tone is 96 pulses per quarter note. This setting can be changed in the Sequence Editor with **SET SYNC CLOCK RATE (SEQ 47)**.

## THE MIDI IN PORT

The MIDI IN port is used for receiving MIDI messages from a computer or other external device. You can connect the 250 to other MIDI devices with the standard 5-pin DIN cable.

## THE MIDI OUT PORT

The MIDI OUT port is used for sending MIDI messages to a computer or other external device. You can connect the 250 to other MIDI devices with the standard 5-pin DIN cable.

## THE MIDI THRU PORT

*This is not a merging port. Only signals present at the MIDI IN port will sent from this port.*

The MIDI THRU port is used for echoing received MIDI messages from a computer or other external device. MIDI messages present at the MIDI IN port will be echoed out the MIDI THRU port. You can connect the 250 to other MIDI devices with the standard 5-pin DIN cable.

## THE POD CABLE CONNECTOR

RMX

This is where you plug in the K250's POD CABLE. The K250 must be connected to the POD in order for it to work. The 250 RMX has its own internal power supply so a Pod and Pod Cable are not needed.

## THE INDIVIDUAL CHANNEL OUTPUTS

The INDIVIDUAL CHANNEL outputs are 12 monophonic audio outputs. They correspond to the 12 250 voice channels. The current Performance Keyboard, any of the 16 MIDI channels, and any of the 12 sequencer tracks can be assigned to one or more of these individual outputs. It is very important to understand that these are monophonic outputs. Only one voice can appear at any output at a given time. For a complete discussion of the 250's INDIVIDUAL CHANNEL outputs see the chapter on the Function Editor.

## THE HIGH LEVEL 1/4" STEREO OUTPUTS

The HIGH Level 1/4" stereo outputs are used for sending the 250's audio output to a mixing board or amplifier. These jacks run 28 volts, peak to peak, with 600 ohm impedance. Use these outputs when connecting the 250 directly to a guitar amplifier or home stereo amplifier. The outputs are line level with 30 dB of headroom. Output volume is controlled by the VOLUME slider.

## THE LOW LEVEL 1/4" STEREO OUTPUTS

The LOW Level 1/4" stereo outputs are used for sending the 250's audio output to a mixing board or amplifier. These jacks run 2.8 volts, peak to peak, with 600 ohm impedance. Use these jacks when

connecting the 250 to the line inputs of a mixing board. Output volume is controlled by the VOLUME slider.

## THE XLR STEREO OUTPUTS

*Of the 3 sets of audio outputs, these will provide the highest quality audio signal.*

The balanced XLR stereo outputs are used for sending the 250's audio output to a mixing board or amplifier. These outputs run 20 volts, peak to peak, with 600 ohm impedance. They are line level with 30 dB of headroom. Output volume is controlled by the VOLUME slider. Use these jacks when connecting the 250 to the mic inputs of a mixing console.

## THE HEADPHONE JACK

The HEADPHONE jack is the standard stereo headphone connection. Its volume is controlled by the VOLUME slider.

## THE EXTERNAL 1 AND 2 JACKS

The EXTERNAL 1 and 2 jacks are 1/4" phone jacks that are used for connecting external foot pedals. They are two of the 250's assignable controls. There are a variety of control and performance functions that can be assigned to these jacks. We recommend the Kurzweil expression pedal, but any volume-type pedal with a 10-100K Ohm potentiometer can be made to work. Simply wire the potentiometer's wiper—its middle lead—to the top of a stereo plug, and the other two leads to the plug's ring and sleeve.

## THE MIC JACK

The MIC jack is a 1/4" phone jack. It is used to record sounds into the 250's digitizer. If, when you plug a microphone into this jack the signal is too strong to be recorded properly, use the less sensitve LINE IN jack. In the digitizer, the input level for this jack can be adjusted with SLIDER 3.

## THE LINE IN JACK

The LINE IN jack is a 1/4" phone jack. It is used to record sounds into the 250's digitizer. If, when you plug a microphone into this jack the signal is too weak to be recorded properly, use the more sensitve LINE IN jack.

*The Front Panel*

## THE LEFT LEVER

The LEFT LEVER is a spring-loaded wheel controller with a center detent. It is one of the 250's assignable controls. Its factory default assignment is Vibrato Depth. Its assignment can be edited by pressing the EDIT button, the LEFT LEVER button, and the SELECT button. You can then use the left and right arrow keys to scroll through the options.

## THE RIGHT LEVER

The RIGHT LEVER is a spring-loaded wheel controller with a center detent. It is one of the 250's assignable controls. Its factory default assignment is Pitch Bend. Its assignment can be edited by pressing the EDIT button, the RIGHT LEVER button, and the SELECT button. You can then use the left and right arrow keys to scroll through the available options.

## THE MASTER VOLUME SLIDER

The MASTER VOLUME slider controls the output level at the 250's main outputs. Moving the slider to the right increases the volume. Moving the slider to the left decreases the volume. To make sure that you're getting the best sound from your 250 set this slider as high as you can without inducing distortion. About a quarter short of full volume seems to be about the best. It is important that you set this level once and leave it alone. To adjust the total volume use your amplifier or mixing board.

*See the section in Volume One for tips on setting the Volume Slider properly.*

## THE INSTRUMENT GROUP A PAN SLIDER

The INSTRUMENT GROUP A pan slider controls the placement of

sounds assigned to Bus A (Output Group 0 in the Keyboard and Instrument Editors, the LEFT audio output on the back panel) in the stereo field. When the slider is in the middle, equal amounts of signal are being sent to each of the 250's main outputs—the sound is centered in the stereo field. Moving the slider to the left decreases the volume in the right output, moving the audio signal to the left of the stereo field. Moving the slider to the right decreases the volume in the left output, moving the audio signal to the right of the stereo field.

## THE INSTRUMENT GROUP B PAN SLIDER

*For the pan sliders to have any effect, the right and left main outputs must be panned hard left and right at your mixing board.*

The INSTRUMENT GROUP B pan slider controls the placement of sounds assigned to Bus B (Output Group 1 in the Keyboard and Instrument Editors, the RIGHT audio output on the back panel) in the stereo field. When the slider is in the middle equal amounts of signal are being sent to each of the 250's main outputs—the sound is centered in the stereo field. Moving the slider to the left decreases the volume in the right output, moving the audio signal to the left of the stereo field. Moving the slider to the right decreases the volume in the left output, moving the audio signal to the right of the stereo field.

Placing both sliders in the center turns the 250 into a monophonic instrument.

## THE MASTER TUNING SLIDER

The MASTER TUNING slider controls the tuning of the 250. Its position affects the 250 globally. When the slider is in its center position the 250 is tuned to the standard A=440. Moving the slider to the right raises the pitch of the 250. Moving the slider to the left lowers the pitch of the 250.

## SLIDER #1

Slider #1 (also referred to as the ALPHA slider) is a fader. It is one of the 250's assignable controls. Its default assignment is Vibrato Rate. Its assignment can be edited by pressing the EDIT button, SLIDER FUNCTION SELECT button #1, and the SELECT button. You can then use the left and right arrow keys to scroll through the available options. This

slider is used in conjunction with the ALPHA button to name things when they are stored in the 250 and in the data cartridge. It is also used in the digitizer to control the loop and trim start points when looping digitized sounds.

## SLIDER #2

*Each of these sliders performs several different functions.*

Slider #2 (also referred to as the VALUE slider) is a fader. It is one of the 250's assignable controls. Its default assignment is Chorus Delay. Its assignment can be edited by pressing the EDIT button, SLIDER FUNCTION SELECT button #2, and the SELECT button. You can then use the left and right arrow keys to scroll through the available options. This slider is used in conjunction with the VALUE button to enter values whenever they are required in 250 editing operations. It is also used in the digitizer to control the loop and trim end points when looping digitized sounds.

## SLIDER #3

Slider #3 (also referred to as the DETUNE slider) is a fader. It is one of the 250's assignable controls. Its default assignment is Brightness. Its assignment can be edited by pressing the EDIT button, SLIDER FUNCTION SELECT button #3, and the SELECT button. You can then use the left and right arrow keys to scroll through the available options. This slider is used in conjunction with the DETUNE button to control the chorus delay amount when the 250's chorus is enabled in Play Mode. It is also used in the digitizer to control the length of the crossfade when looping digitized sounds.

## THE SLIDER FUNCTION SELECT BUTTONS

The SLIDER FUNCTION SELECT buttons are used to enable the three vertical sliders. In most cases, a slider cannot be used until it is enabled by pressing the appropriate SLIDER FUNCTION SELECT button.

## THE ALPHA BUTTON

The ALPHA button is used in conjunction with the ALPHA slider when

naming things to be stored in the 250 or in the K250's data cartridge.

*When entering values with the VALUE slider, pressing the VALUE button a second time puts the slider into Fine Mode for the entry of more precise values.*

## THE VALUE BUTTON

The VALUE button is used to enable the VALUE slider whenever you want to use the VALUE slider to enter a number for any 250 operation. In most cases the VALUE button must be on before the VALUE slider can be used.

## THE DETUNE BUTTON

The DETUNE button is used activate SLIDER #3 for adjusting Chorus Detune while in the Chorus Editor.

## THE FOOT PEDAL BUTTONS

The FOOT PEDAL buttons are used to edit the controller assignments for the LEFT, RIGHT, and EXTernal foot pedal controllers.

**RMX**

The RMX does not have these five buttons but their functions are still programmable as described below.

## THE LEFT FOOT PEDAL BUTTON

The LEFT Foot Pedal button is used to edit the assignment of the LEFT PEDAL. Pressing EDIT, LEFT PEDAL allows you to view and edit the controller assignment for the LEFT foot pedal. The default is Mute, which silences all 250 notes.

## THE EXTERNAL FOOT PEDAL BUTTON

The EXTernal Foot Pedal button is used to edit the assignment of EXTERNAL controller #1. Pressing EDIT, EXT PEDAL allows you to view and edit the controller assignment for EXTERNAL controller #1. Scroll right to assign EXTERNAL controller #2. The default is Channel Volume.

## THE RIGHT FOOT PEDAL BUTTON

The RIGHT Foot Pedal button is used to edit the assignment of the RIGHT PEDAL. Pressing EDIT, RIGHT PEDAL allows you to view and edit the controller assignment for the RIGHT foot pedal. The default is Sustain.

## THE LEVER BUTTONS

The LEVER buttons are used to edit the controller assignments for the RIGHT and LEFT levers.

## THE LEFT LEVER BUTTON

The LEFT Lever button is used to edit the assignment of the LEFT LEVER. Pressing EDIT, LEFT LEVER allows you to view and edit the controller assignment for the LEFT LEVER. The default is Vibrato Depth.

## THE RIGHT LEVER BUTTON

The RIGHT Lever button is used to edit the assignment of the RIGHT LEVER. Pressing EDIT, RIGHT LEVER allows you to view and edit the controller assignment for the RIGHT LEVER. The default is Pitch Bend.

## THE CHORUS BUTTON

*The 250's powerful Chorusing options can be edited in real-time as you play!*

The CHORUS button is used to turn on global chorusing when the 250 is in Play Mode. When chorusing is on, the light on the CHORUS button will be lit. Pressing EDIT, CHORUS allows you to edit the 250's global chorus effects. The global chorus effects apply only to the 250's Performance Keyboard, not to sequencer tracks or MIDI channels.

## THE LEVEL BUTTON (SPLIT KEYBOARD ON OLDER MODELS)

The LEVEL button is used in the Keyboard Editor to takes you to SET

LAYER DYNAMICS (KBD 20) and in the Sequence Editor to take you to ENABLE/DISABLE CLICK (SEQ 49). This button can also be used as a "Panic Button" in Play Mode. Pressing it turns off any of the 250's voices which are sounding at the time and sends out a MIDI All Notes Off message to silence all connected MIDI devices.

## THE TRANSPOSE UP BUTTON

The TRANSPOSE UP button is used to transpose the current Keyboard upward. Press EDIT, TRANSPOSE to enter the Transpose Editor.

## THE TRANSPOSE DOWN BUTTON

The TRANSPOSE DOWN button is used to transpose the Keyboard (and associated sounds) downward. Press EDIT, TRANSPOSE to enter the Transpose Editor.

## THE NUMERIC KEYPAD

*Use the numeric keypad when you want to enter an exact value.*

The numeric keypad is used to enter data when performing operations on the 250.

## NUMBERS 0-9

Numbers 0-9 are used to enter values when performing operations on the 250. They are also used to call up Keyboards and sequences from the 250 Keypad Bins.

## THE PLUS/MINUS BUTTON

The PLUS/MINUS button is used to change values entered with numeric keypad from positive to negative numbers.

## THE F BUTTON

The F button is used to enter the Function Editor when the 250 is in

Play Mode.

## THE 250 LCD DISPLAY

The display is your window into the inner workings of the 250. It is a two-line, 48-character LCD display that is backlit for easy viewing in low light situations. All direct communication between the user and the 250 takes place through the display.

## THE YES BUTTON

The YES button is used to answer YES/NO questions when performing operations with the 250. In Play Mode it is used to call up Keyboards and sequences in Bin Bank 1.

## THE SELECT BUTTON

*This button gets pressed more frequently than any other on the 250. Don't press it too hard. You may eventually wear it out.*

The SELECT button is the most frequently pressed button on the 250. It is used to initiate virtually every operation performed on the 250. If you have entered a value from the numeric keypad, you will need to press the SELECT button twice to complete your entry. The first press will select the value you have entered, allowing you to change it if you wish—simply enter another value from the keypad. The second press will cause the 250 to perform the action. In Play Mode, pressing the SELECT button calls up Bin Bank 2.

## THE NO BUTTON

The NO button is used to answer YES/NO questions when performing operations with the 250. In Play Mode it is used to call up Bin Bank 3.

## THE DISPLAY CONTRAST CONTROL

Just to the left of the number 7 on the numeric keypad is a small black bump. This is a seal that covers the 250's Display Contrast Control. If you are having trouble viewing the display, remove the seal and adjust the contrast control with a small screwdriver.

### THE KEYBOARD BUTTON

*If Keyboard Preview is on, you'll be able to hear each Keyboard as you scroll through the list.*

The KEYBOARD button is used to call up Keyboard Setups from memory. When the 250 is in Play Mode, pressing the KEYBOARD button allows you to select a Keyboard Setup from memory and play it on the 250 keyboard.

### THE PLAY BUTTON

The PLAY button is used to put the 250 in Play Mode. In general, you can think of it as an escape button. Whenever you find yourself deeply nested in the 250's hierarchy of menus and sub-menus you can use the PLAY button to dig your way out. By repeatedly pressing the PLAY button you will be able to return to Play Mode from almost anywhere in the 250's menu structure. In the 250 Sequencer, the PLAY button is used to turn sequence playback on and off.

## *The Cursor Keys*

### THE UP ARROW BUTTON

The Up Arrow button is used to navigate through the 250's menu structure and to scroll through lists of menu options. Like the PLAY button it can usually be used to exit the current menu item (take you one level up).

### THE DOWN ARROW BUTTON

The Down Arrow button is used to navigate through the 250's menu structure and to scroll through lists of menu options. It can sometimes function like the SELECT button to enter into the next menu level (take you one level down).

### THE LEFT ARROW BUTTON

The Left Arrow button is used to navigate through the 250's menu structure and to scroll through lists of menu options.

## THE RIGHT ARROW BUTTON

The Right Arrow button is used to navigate through the 250's menu structure and to scroll through lists of menu options.

## THE "R" BUTTON (RESET, REMOTE)

*See the illustration in the chapter on the Play Editors for a complete layout of the button assignments in Remote Mode.*

The "R" button can be used when entering values or naming objects to reset the display, allowing you to start over and re-enter another name or value. If you make a mistake while naming an object or entering a value, press the "R" button to start over. In PLAY mode, pressing this button puts the 250 into Remote Mode so that it can be used to control Kurzweil K1000 series keyboards and expander modules.

## THE INSTRUMENT BUTTON

The INSTRUMENT button is used to enter the digitizer when the 250 is in Play Mode and the Instrument Editor by pressing EDIT, INSTRUMENT.

## THE SEQUENCE BUTTON

The SEQUENCE button is used to turn on the 250 sequencer when the 250 is in Play Mode and to enter the Sequence Editor by pressing EDIT, SEQUENCE.

## THE RECORD BUTTON

The RECORD button is used in the digitizer to begin the recording process when you are sampling. It is used in the sequencer to begin recording when you are composing.

## THE CONTINUE BUTTON

The CONTINUE button is used in the Sequence Editor to take you to START/STOP SEQUENCE (SEQ 10). It is used in the digitizer to take you to ASSIGN SOUND TO KBD (DIG 10). When the Sequencer is on,

in Play Mode, pressing this button will cause playback to resume from the current measure assigned using the SET POINTER button and the numeric keypad.

## THE LOOP BUTTON

The LOOP button is used in the Sequence Editor to take you to RE-CHAIN SEQUENCE (SEQ 26). It is used in the digitizer to take you to LOOP SOUND (DIG 4). When recording a sequence track, pressing LOOP instead of RECORD at the end of your take will loop the entire track. It is tricky, however, to press LOOP at just the right time.

## THE TEMPO UP BUTTON

*You can edit the tempo of a sequence in real-time as it plays back.*

The TEMPO UP button is used to edit the tempo of the current sequence. It can also be used to temporarily adjust sequence tempo during playback. Pressing this button in the Sequence Editor takes you to SET/CLEAR QUANTIZATION (SEQ 39). Also, in Play Mode with the sequencer on, EDIT, TEMPO enables numerical change.

## THE TEMPO DOWN BUTTON

The TEMPO DOWN button is used to edit the tempo of the current sequence. It can also be used to temporarily adjust sequence tempo during playback. Pressing this button in the Sequence Editor takes you to SET SEQUENCE TEMPO (SEQ 38).

## THE EDIT BUTTON

The EDIT button is used to initiate any editing function you wish to use. Press EDIT before pressing the button corresponding to the editor you wish to enter.

## THE SEARCH BUTTON

The SEARCH button is used in the Sequence Editor to search for events when editing your sequences. This button is also used to activate and

*For a complete discussion of the Mixboard, see the chapter on the Play Editors.*

de-activate the Mixboard in Play Mode.

### THE SAVE BUTTON

The SAVE button takes you to the library save options in each editor.

### THE ERASE BUTTON

The ERASE button takes you to the library erase options in each editor. You can use it when recording sequences, to erase tracks or entire sequences.

### THE SET POINTER BUTTON

The SET POINTER button is used in the Sequence Editor to set the current position of the edit pointer. When the Sequencer is on, in Play Mode, it sets the Play Pointer to be used in conjunction with the CONTINUE button.

### THE INSERT BUTTON

The INSERT button is used in Play Mode to send MIDI program changes to external devices. It is also used in the Sequence Editor to insert events into sequence tracks.

### THE LIST BUTTON

The LIST button is used to access the 250's List of Keyboard Setups. When the sequencer is on, this button is used to access the 250's List of sequences.

### THE MIDI BUTTON (MODE 1 on older models)

The MIDI button is used in Play Mode to turn MIDI on and off.

### THE SYNC BUTTON (MODE 2 on older models)

The SYNC button is used in Play Mode to enable and disable sync functions.

### THE COMPUTER BUTTONS (STORAGE on older models)

The COMPUTER buttons are used to enter the Cartridge Menus.

### THE READ BUTTON

*There is a special function in the READ options called Yodel. Don't miss it!*

The READ button is used to access the READ options when using the K250 RAM Cartridge. In the Sequence Editor pressing this button takes you to LOAD SEQ TO EDIT (SEQ 9).

### THE SEND BUTTON

The SEND button is used to access the SEND options when using the K250 RAM Cartridge. In the Sequence Editor pressing this button takes you to LOAD TRACK TO EDIT (SEQ 12).

## *Underneath the 250*

### THE POD

RMX

The POD contains the power supply of the 250. Be very careful with the POD. Even though it sits quietly under the 250 and does not appear to do anything more useful than hold up the left and right pedals it is very, very important. Without the POD your 250 will not work. It was designed to be separate from the 250 to reduce the weight of the main unit and to make servicing easier. Do not mistreat the POD. The RMX has no pod; its power supply is self-contained.

### THE POWER SWITCH

RMX

The POWER switch is located on the front of the POD. Press this switch with your foot to turn the 250 on and off. On the RMX, the power switch is on the back to the left of the fan.

## THE LEFT PEDAL

The left PEDAL is one of the 250's assignable controls. Its default assignment is Mute. Its assignment can be edited by pressing EDIT, LEFT PEDAL.

## THE RIGHT PEDAL

The RIGHT PEDAL is one of the 250's assignable controls. Its default assignment is Sustain. Its assignment can be edited by pressing EDIT, RIGHT PEDAL.

**RMX**

The RMX has no foot pedals but all pedal functions are properly assigned. Your MIDI controller will have controller outputs which can be used to control the RMX.

## THE POD CABLE

The POD CABLE connects the 250 to the POD. The POD CABLE is the 250's umbilical cord. It must be connected in order for the 250 to work. Be careful with the POD CABLE. It contains lots of wires all of which must be functioning in perfect order for the 250 to operate. Notice that when the POD CABLE is connected that it sticks out the back of the 250 for several inches. If you place your 250 against a wall (as most people do) be sure to allow enough room between the 250 and the wall for the POD CABLE. The RMX has no POD and, thus, no POD CABLE.

**RMX**

## THE CARTRIDGE

The CARTRIDGE is a permanent portable data storage device that can be used to augment the user memory on board the 250. It holds approximately 262,000 bytes of information. To install the CARTRIDGE gently push it into the cartridge slot right underneath middle C on the 250 keyboard. The write-protect switch should be facing you at all times. When the CARTRIDGE reaches the end of its travel push it firmly into place. The CARTRIDGE will click into place. When inserting or removing the CARTRIDGE always set the write-protect switch to the PROTECTED position. See the section on the CARTRIDGE Menus for

**RMX**

more information. The RMX does not use the CARTRIDGE.

## THE PERFORMANCE STAND

The KEYBOARD STAND is an optional but highly recommended accessory. It is both fashionable and funtional. The 250 fits snugly on top of it. It is far better to have the 250 on the stand than on a table or other piece of furniture. And for live performance the stand is perfect because it is light, its appearance matches that of the 250, and it is quick and easy to assemble and adjust.

# Getting Around: The 250 User Interface

# 2

Chapter Two

# *The 250 User Interface*

Getting around on the 250 is easy once you understand the user interface. If you are an experienced 250 user you can probably skip this chapter (except for the last bit about changes to the editors). But if you are learning the 250 for the first time, this chapter will be very helpful. The user interface elements discussed in this chapter will cover most of your interaction with the 250.

## *LCD Displays*

### FOUR KINDS OF DISPLAYS

In general, the 250 will present you with four different kinds of displays: Menus, Headings, Questions, and Information.

Menus are the doorways into the heart of the 250. Menu displays often end with a question mark and almost always have an identifying title in the bottom right hand corner of the display. Pressing the SELECT button when a menu item is in the display takes you into that item for further editing. Here's a typical menu display:

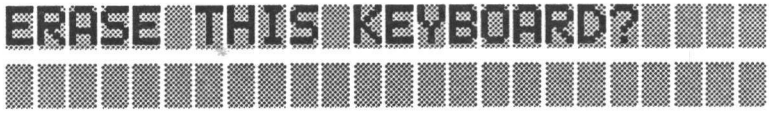

Headings usually identify a function of the 250 or a specific parameter for which you are entering a value. Headings almost always end with a

colon, like this:


Usually you'll be entering a value with the VALUE slider or the numer keypad, or you'll be scrolling through a list of options with the left ar right arrow keys.

*Understanding the different types of displays can get you up and running on the 250 very quickly.*

Questions are fairly obvious. They always end in a question mark an can be answered with the YES and NO buttons. Here's a typical ques tion:




Often, as in this case, the YES and NO buttons will flash to tell you exactly how to respond.

Information displays require no input from the user. They simply display information for your use, like this one from the Keyboard Editor which lets you know how much room you have left in the Keyboard library:


*Navigation*

## MOVING THROUGH THE MENUS

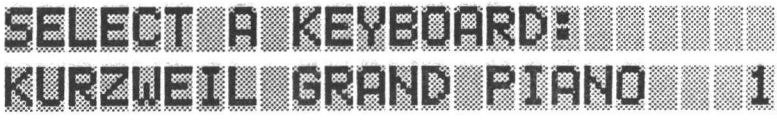
As you've probably noticed by now, the 250 editors are organized as series of menus. Knowing how to get from one menu to another is a basic maneuver that you'll perform often. Whenever you are in an editor you can get from one menu item to any other menu item instantly by entering that menu item's number from the numeric keypa and pressing the SELECT button. If you are unfamiliar with the numbers you can cycle through most of the menu items in an editor with

the left and right arrow keys. Last but not least, many of the front panel buttons are linked to menu items. Pressing the SAVE button, for instance, usually takes you to the appropriate save menu for the editor you are in. At the end of each chapter in this volume there is a list of the front panel buttons and the menu items they access.

## SELECTING KEYBOARDS, INSTRUMENTS, SEQUENCES, AND SOUNDFILES

Whenever you want to use or edit an exisiting Keyboard, Instrument, Sequence, or Soundfile, you have to select the appropriate object from its library. The displays for each of these object types are virtually identical. Here's the one from the Keyboard Editor:

*Keyboards, Instruments, Sequences, and Soundfiles are sometimes collectively referred to as objects. Don't let this terminology get you down. You'll catch on quickly.*




The heading on the top line tells you what to do. The bottom line shows the current object (in this case a Keyboard). If you know the number of the object you want to work with you can enter it from the numeric keypad and press the SELECT button. If you don't know the number you can use the four arrow keys to scroll through the entire library one item at a time.

## ENTERING VALUES

There are two ways to enter values for 250 parameters. Whenever you are prompted for a numeric value you can enter that number directly from the numeric keypad and the press the SELECT button. In most cases, you can also enter the value with the VALUE slider. To activate the VALUE slider you must press the VALUE button to turn its light on. Once the button is lit, moving the VALUE slider generates a value in the display. The VALUE slider has two modes. In coarse mode the values in the display will change greatly for even slight movements of the slider. In fine mode the change will be much smaller. To go from coarse to fine mode press the VALUE button a second time. When the VALUE slider is in fine mode the VALUE button will blink.

*Don't forget about fine mode!*

## SELECTING OPTIONS FROM A LIST

Often, you'll need to select one item from a list of options. There are three different ways to do this. You can scroll through the list of options with the left and right arrow keys, you can enter the corresponding option numbers with the numeric keypad, and sometimes you can use the VALUE slider to move quickly through the list.

There are several instances when the 16 MIDI channels will appear as 16 options in a list. In this case you can select a MIDI channel by pressing any of the buttons in the ASSIGNABLE CONTROLS section of the front panel and the YES button. Take a look at the accompanying illustration at the end of this chapter for the layout and mapping of buttons to MIDI channels. (If you have an RMX, some of these buttons will not be present, but you can always scroll through the channels with the left and right arrow keys).

RMX

Similarly, when the 12 sequence tracks appear as options in a list you can use the Mixboard buttons to select them. The Mixboard comprises the 12 buttons (6 pairs) in the lower right hand corner of the front panel.

## NAMING THINGS

Keyboards, Instruments, Sequences, and Soundfiles can all have names. To name things on the 250 use the ALPHA slider. Whenever the 250 prompts you to name something you'll be given the first letter in the display. To change the letter, move the ALPHA slider. To add another letter press the ALPHA button. You have a complete upper case alphabet, all the digits, and various other characters, including a space. This confirms the character you have entered and moves you over one character to the right. If you make a mistake you can move back one letter by pressing the "R" button. Once you've entered a name (being sure to press the ALPHA button after entering the last character) press the SELECT button to record the name.

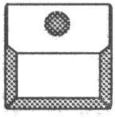
## TAKING ACTION (SELECT, YES, NO)

The SELECT, YES, and NO buttons have a variety of uses but they are primarily used for taking action. Merely entering a value for a parame-

ter is not enough. In order for the change to take effect you usually hit the SELECT button. In many cases you will press the SELECT button twice in a row, once to select the value and again to execute the function or record the value. In these cases, if you haven't yet pressed the SELECT button a second time you can still change the value you have entered.

## FOR USERS OF OLDER K250 MODELS

Some of the buttons on the front panel originally had different names than they do now. We've tried to note these changes throughout the manual but here's the complete list in one place:



The LEVEL button was labeled SPLIT KEYBOARD. The MIDI button was labeled MODE 1. The SYNC button was labeled MODE 2. The CONTINUE button was labeled ASSIGN TO KEYS. And the heading over the READ and SEND buttons (now labeled COMPUTER) was previously labeled STORAGE.

## THE AUTO REPEAT EFFECT

*Using the auto repeat feature can save your buttons unnecessary wear and tear.*

Pressing and holding a button (where appropriate) can produce an auto repeat effect simulating many rapid button presses. To see this feature work, press EDIT, KEYBOARD, and then hold down the DOWN ARROW button. You'll see the 250 Keyboards scroll rapidly through the display.

## A NOTE ABOUT THE EDITORS FOR 250 USERS OLD AND NEW

The Keyboard and Instrument Editors have been modified to make them easier to learn and use. Hopefully, this will benefit all 250 users, even those who already know the instrument inside and out. Most of these changes have been proposed by experienced users.

The basic idea is to standardize the interface so that all the editors work in much the same way. This standard is based on the pre-version 6 Sequence Editor, MIDI Editor, and Function Editor. The Instrument Editor was already very close to this standard; the Keyboard Editor has

undergone the most significant changes.

All editors possess these basic attributes whenever possible:

Each editor is arranged as a series of menu items. Each item is numbered and named.

If there are more than a dozen items, they are organized hierarchically.

*The new Version 6.0 user interface is more consistant than previous versions. This will make the 250 easier to learn and to use.*

Once inside an editor you can go directly to any item by typing in the corresponding number and pressing the SELECT button.

You can also go directly to an item by pressing any of the front panel buttons that have been assigned to menu items. At the end of each chapter dealing with an editor there is a list of the front panel buttons and the menu items they reference, if any.

You can also navigate through the items with the arrow keys. The LEFT and RIGHT arrow buttons take you through the menu items one at a time. The UP and DOWN arrow buttons take you to other levels in the menu hierarchy. The SELECT button takes you down a level (or, *in* a level, depending on how you envision it). The PLAY button takes you up (and eventually out).

Once you have found the item you have been looking for, pressing the SELECT button or the DOWN CURSOR button takes you into that item.

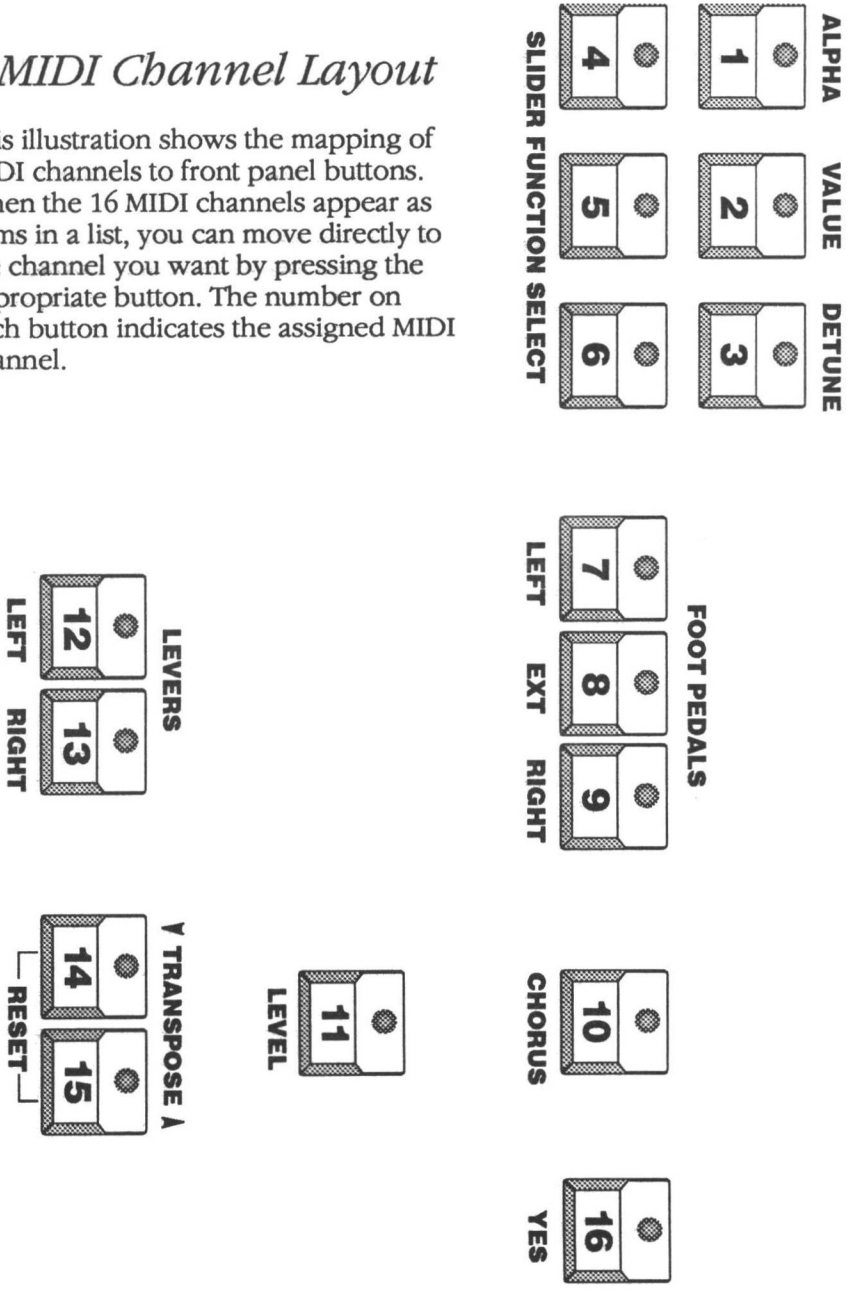
If the item does not automatically exit, press the PLAY button to get yourself out.

## ONE FINAL INTERFACE NOTE

The illustration on the next page shows the mapping of front panel buttons to MIDI channels. When the 16 MIDI channels appear as items in a list, you can move directly to the channel you want by pressing the appropriate button.

## *MIDI Channel Layout*

This illustration shows the mapping of MIDI channels to front panel buttons. When the 16 MIDI channels appear as items in a list, you can move directly to the channel you want by pressing the appropriate button. The number on each button indicates the assigned MIDI channel.




*This new interface enhancement will come in handy when assigning Keyboards to MIDI channels and using the 250's individual outupts.*

# *The Play Editors*

# 3

*Chapter Three*

# *The Play Editors*

The Play Editors are several miscellaneous mini-editors that can all be accessed from Play Mode. Most of these editors pertain to performance applications because they can be accessed while you are playing the 250.

## *Overview*

### PLAY MODE

Play Mode is the 250's normal mode of operation. The name of the current Keyboard Setup is in the top line of the display and the words PLAY MODE are in the bottom line. When you play the Keyboard the current Setup will sound. When you use the levers, pedals, and other controls they affect the sound of the current Keyboard as you play. Play Mode is sometimes called Performance Mode.

In Play Mode many of the 250's front panel controls are active. Here is a list of the front panel controls that can be used in Play Mode and a description of their functions.

### THE FOUR MASTER SLIDERS

The four MASTER group sliders are always active.

## THE ASSIGNABLE CONTROLS

All assignable controls (the pedals, levers, and sliders) are active depending on their assignment. Each one controls a particular function as assigned in the Assignable Controls Editor. The only exceptions to this are the three sliders which must be activated (by hitting the appropriate slider function select button) before they can be used to control real time performance. Each control can be used to affect the sound of the current Keyboard.

## THE SLIDER FUNCTION SELECT BUTTONS

Pressing SLIDER FUNCTION SELECT button #1 enables SLIDER #1.
Pressing SLIDER FUNCTION SELECT button #2 enables SLIDER #2.
Pressing SLIDER FUNCTION SELECT button #3 enables SLIDER #3.

## THE CHORUS BUTTON

*The 250's global chorus effect can be edited in real-time as you play.*

Pressing the CHORUS button turns on the 250's global chorusing. It also displays the current chorus type and the current values for delay and detune. The chorus can be edited as you play by using SLIDER #2 (press the SLIDER #2 Function Select button) which controls the delay amount, and SLIDER #3 (press DETUNE) which controls the detune amount. Press the PLAY button to return to the usual Play Mode display. For information on editing the 250's global chorus settings see the section on the Chorus Editor later in this chapter.

## THE TRANSPOSE BUTTONS

Pressing the TRANSPOSE DOWN button displays the current transposition type, the transposition amount, and transposes the Keyboard down one unit according to the transposition type selected. Successive presses continue to transpose the Keyboard downward. Press the PLAY button to return to the usual Play Mode display.

Pressing the TRANSPOSE UP button displays the current transposition type, the transposition amount, and transposes the Keyboard up one unit according to the transposition type selected. Successive presses continue to transpose the Keyboard upward. Press the PLAY button to

return to the usual Play Mode display.

For information on editing the 250's transposition settings see the section on the Transpose Editor later in this chapter.

## BIN BANKS—THE YES, NO, AND SELECT BUTTONS

Pressing the YES button calls up Bin Bank 1. Any Keyboards or sequences assigned to Bin Bank 1 can now be triggered by pressing a number key on the numeric keypad. Press the PLAY button to return to the usual Play Mode display.

*The Bin Banks are the keys to real-time performance on the 250. See the chapter on performance applications in Volume One for a complete discussion.*

Pressing the SELECT button calls up Bin Bank 2. Any Keyboards or sequences assigned to Bin Bank 2 can now be triggered by pressing a number key on the numeric keypad. Press the PLAY button to return to the usual Play Mode display.

Pressing the NO button calls up Bin Bank 3. Any Keyboards or sequences assigned to Bin Bank 3 can now be triggered by pressing a number key on the numeric keypad. Press the PLAY button to return to the usual Play Mode display.

## THE NUMERIC KEYPAD

Pressing any of the number keys (0 through 9) calls up the sequence or Keyboard assigned to that bin location. The current bin bank is determined by the YES, SELECT, and NO buttons. Press the PLAY button to return to the usual Play Mode display.

RMX

Pressing the F button enters the Function Editor and takes you to **RMX/250 SETUP**, the first of the Function Editor menu items. Press the PLAY button to return to the usual Play Mode display.

## THE KEYBOARD BUTTON

Pressing the KEYBOARD button causes the 250 to prompt you for the number of a Keyboard you want to become the current Keyboard. You can play each Keyboard before actually selecting one by scrolling through the list of ROM and user Keyboards with the four arrow keys.

Or, you can enter the number of a Keyboard directly from the numeric keypad and press the SELECT button. Press the SELECT button a second time to make the new Keyboard you have chosen the current Keyboard, or press the PLAY button to return to the usual Play Mode display with the original current Keyboard intact.

## THE INSTRUMENT BUTTON

Pressing the INSTRUMENT button takes you to RECORD SOUND (DIG 1) the first menu item in the digitizer. Press the PLAY button to return to Play Mode.

## THE SEQUENCE BUTTON

Pressing the SEQUENCE button activates the 250 sequencer. Pressing the RECORD button at this point will allow you to record a sequence track using the current Keyboard. Press the SEQUENCE button again to turn the sequencer off.

## THE EDIT BUTTON

Pressing the EDIT button instructs the 250 to activate one of its many editors. The next button you push will activate the editor associated with that button.

## THE LIST BUTTON

Pressing the LIST button displays the current list entry and makes it the current Keyboard. Use the arrow keys to scroll through the list entries. Each time a new list entry is called up it becomes the active Keyboard. Like the Bins the List is a good way to cycle through your favorite set of Keyboards.

## THE SEARCH BUTTON

Pressing the SEARCH button activates the Mixboard. For more information on the Mixboard see the chapter on the 250 sequencer.

## THE "R" BUTTON

Pressing the red "R" button puts the 250 into Remote Mode. This is used for controlling Kurzweil's 1000 series Keyboards and expanders. See the section on Remote Mode later in this chapter.

*If you are unable to receive or transmit over MIDI, press this button. MIDI may be turned off.*

## THE MIDI BUTTON

Pressing the MIDI button turns MIDI on and off. When MIDI is off the 250 will not send or receive MIDI data. Press the PLAY button to return to the usual Play Mode display. On older units, this button is labeled MODE 1.

## THE SYNC BUTTON

Pressing the SYNC button enables and disables the 250's sync functions. For more information on synchronization see the chapter on the 250 sequencer. On older units, this button is labeled MODE 2.

## THE SET POINTER BUTTON

Pressing the SET POINTER button allows you to set the position of the play pointer for the 250 sequencer without entering the Sequence Editor. For more information on the play pointer see the chapter on the 250 sequencer.

*The K250 can function like a MIDI controller. Its extensive MIDI implementation makes it a good choice if you have many different MIDI devices in your setup.*

## THE INSERT BUTTON

Pressing the INSERT button allows you to send MIDI program changes to other MIDI devices from the 250. See the section on sending MIDI program changes later in this chapter.

## THE READ BUTTON

Pressing the READ button takes you to GET CARTRIDGE INFO (READ 1), the first menu item in the READ options of the Cartridge Menus. For

more information, see the section on the Cartridge Menus later in this chapter.

### THE SEND BUTTON

Pressing the SEND button takes you to INSTALL OBJECT IN CART (SEND 1), the first menu item in the SEND options of the Cartridge Menus. For more information, see the section on the Cartridge Menus later in this chapter.

## *The EDIT Button*

### WHEN THE EDIT BUTTON IS ON

Pressing the EDIT button while in Play Mode lights the EDIT button and allows you to enter any of the 250's main editors. As in Play Mode, many of the 250's front panel controls are active when the EDIT button is lit. Here is a list of the front panel controls that can be used when the EDIT button is lit and a description of their functions.

Every time you want to change one of the 250's programmable parameters, you will enter the appropriate editor. Entering an editor always begins with the EDIT button.

### THE SLIDER FUNCTION SELECT BUTTONS

Pressing SLIDER FUNCTION SELECT button #1 enters the Assignable Controls Editor and allows you to edit the control assigned to SLIDER #1. For more information, see the section on the Assignable Controls Editor later in this chapter.

Pressing SLIDER FUNCTION SELECT button #2 enters the Assignable Controls Editor and allows you to edit the control assigned to SLIDER #2. For more information, see the section on the Assignable Controls Editor later in this chapter.

Pressing SLIDER FUNCTION SELECT button #3 enters the Assignable Controls Editor and allows you to edit the control assigned to SLIDER #3. For more information, see the section on the Assignable Controls Editor later in this chapter.

## THE FOOT PEDAL BUTTONS

Pressing the LEFT PEDAL button enters the Assignable Controls Editor and allows you to edit the control assigned to the left pedal. For more information, see the section on the Assignable Controls Editor later in this chapter.

*Editing the Assignable Controls is easy. Just remember, no two controls can have the same assignment.*

Pressing the EXTERNAL button enters the Assignable Controls Editor and allows you to edit the control assigned to EXTERNAL 1. For more information, see the section on the Assignable Controls Editor later in this chapter.

Pressing the RIGHT PEDAL button enters the Assignable Controls Editor and allows you to edit the control assigned to the right pedal. For more information, see the section on the Assignable Controls Editor later in this chapter.

## THE LEVER BUTTONS

Pressing the LEFT LEVER button enters the Assignable Controls Editor and allows you to edit the control assigned to the left lever. For more information, see the section on the Assignable Controls Editor later in this chapter.

Pressing RIGHT LEVER button enters the Assignable Controls Editor and allows you to edit the control assigned to the right lever. For more information, see the section on the Assignable Controls Editor.

**RMX**

There are no lever buttons on the RMX.

## THE CHORUS BUTTON

Pressing the CHORUS button takes you to CHORUS TYPE (CHOR 1) the first menu item in the Chorus Editor. For more information, see the section on the Chorus Editor later in this chapter.

## THE TRANSPOSE BUTTONS

Pressing the TRANSPOSE DOWN button takes you to EDIT TRANSPO-

SITION MODE, the first menu item in the Transpose Editor. For more information, see the section on the Transpose Editor later in this chapter.

Pressing the TRANSPOSE UP button takes you to EDIT TRANSPOSITION MODE, the first menu item in the Transpose Editor. For more information, see the section on the Transpose Editor later in this chapter.

## THE NUMERIC KEYPAD

*Remember, you can assign sequences as well as Keyboards to the bin locations.*

Pressing any of the number keys on the numeric keypad (0 through 9) takes you to the Keypad Bins Editor and allows you to edit the current bin location. For more information, see the section on the Keypad Bins Editor later in this chapter.

## THE KEYBOARD BUTTON

Pressing the KEYBOARD button takes you to the Keyboard Editor. For more information, see the chapter on the Keyboard Editor.

## THE INSTRUMENT BUTTON

Pressing the INSTRUMENT button takes you to the Instrument Editor. For more information, see the chapter on the Instrument Editor.

## THE SEQUENCE BUTTON

Pressing the SEQUENCE button takes you to the Sequence Editor. For more information, see the chapter on the 250's sequencer.

## THE LIST BUTTON

Pressing the LIST button takes you to the LIST Editor. For more information, see the section on the List Editor later in this chapter.

## THE MIDI BUTTON

Pressing the MIDI button takes you to the MIDI Editor. For more information, see the chapter on the MIDI Editor.

## THE TEMPO BUTTONS

Pressing the TEMPO DOWN button allows you to edit the tempo of the current sequence. For more information, see the chapter on the Sequencer.

Pressing the TEMPO UP button allows you to edit the tempo of the current sequence. For more information, see the chapter on the Sequencer.

## RESETTING THE 250

*To perform a soft reset, you must hold down the 4 and 5 buttons (and keep them down) while you press the SELECT button.*

There are several different ways to reset the 250. Use them to correct any problems that might occur. If you have any problems in Play Mode press the PLAY button. If that doesn't fix things, hold down the 4 and 5 buttons on the numeric keypad and press the SELECT button. This is a soft reset. It will reset the 250 without deleting any data in memory. If a soft reset doesn't work, turn the 250 off, hold down the READ, SEND, and LIST buttons, and turn the 250 back on. This is a hard reset. All user memory will be deleted and the 250 will be returned to its original factory default condition.

## REMOTE MODE

Remote Mode allows the 250 to control virtually any number of Kurzweil 1000 series keyboards and expander modules. By connecting the 250 to a 1000 series instrument over MIDI you can control the instrument from 250's front panel. When the 250 is in Remote Mode certain front panel buttons (see the illustration below) correspond to the front panel buttons on the 1000 series keyboards and expanders. Not only that, but the display of your 1000 series instrument can be seen in the 250's display for complete remote operation.

To use Remote Mode, connect the MIDI OUT of the 250 to the MIDI IN

of your 1000 series instrument. That establishes the communications link from the 250 to the 1000. To see the display on the 1000 series instrument in the 250's display, connect the MIDI OUT of your 1000 series instrument to the MIDI IN of your 250. When the connections are made, the button presses on the 250 will be sent out over MIDI and interpreted by the 1000 as button presses on its front panel. Every time the display changes on the 1000 it will send the contents of its display over MIDI back to the 250 so that you can see everything you're doing.

*Remote Mode is a powerful feature. It turns your K250 and 1000 series expanders into a completely integrated music system.*

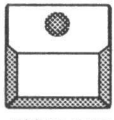
This is true remote operation at its very best. With the right MIDI cables you could put a rack of 1000 series expanders in another room and still use them just as effectively as if they were right in front of you. If you do use Remote Mode with more than 1000 series instrument just remember that each one must be set to a different ID number and that the MIDI OUTs of each 1000 series unit must be merged back to the single MIDI IN on your 250. A simple passive MIDI merger can be used to accomplish this.

The illustration on the next page shows the front panel buttons on the 250 and the buttons they control on the 1000 series expanders and Keyboards. The buttons labeled A, B, C, 0-9, Enter, and Store are primarily for use with the K1000, but the PX, HX, and SX will respond to the numeric keypad when you want to call up a program directly. Double presses are not directly supported, instead press either of the buttons labeled DOUBLE PRESS, then press the desired button.

*Remember, in order to get the display of a 1000 series instrument back to the 250 its MIDI OUT must be connected to 250's MIDI IN.*

Because the 1000 will occasionally put up a message that goes away after only a few seconds (when saving a program, for instance) the 250 will sometimes show the wrong display—it doesn't know that the last message is no longer in the 1000's display. When this happens the 250 display can be updated by pressing either of the buttons labeled UPDATE DISPLAY. This will refresh the 250 display automatically.

## SENDING MIDI PROGAM CHANGES FROM THE 250



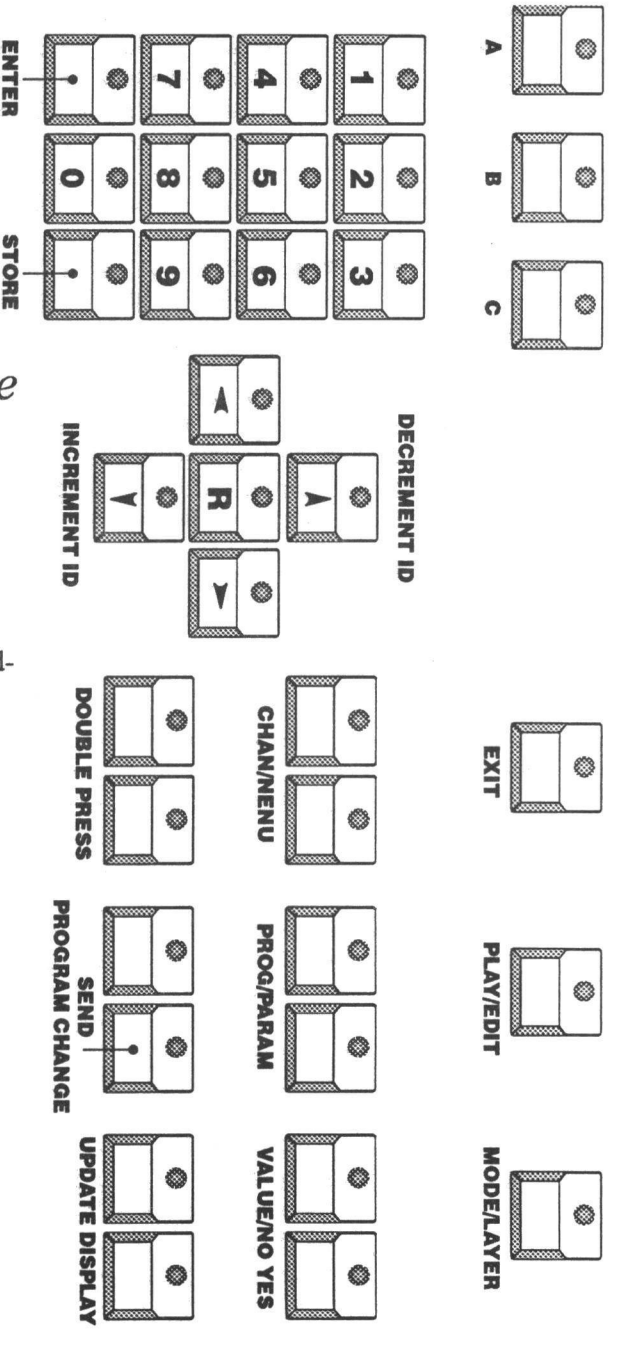
**INSERT**

It is possible to send MIDI program changes from the 250 to other MIDI devices while in Play Mode. Pressing the INSERT button causes the 250 to prompt you for the MIDI channel over which you wish to send a program change. Use the left and right arrow keys to select the channel. Once you've found the channel, pressing the SELECT button causes the 250 to prompt you for the program change you wish to

*If you use Remote Mode a lot, you may want to photocopy this layout and put it on the 250's music rack for quick reference.*

## *Remote Mode Layout*

This illustration shows the 250 front panel buttons and the functions they control on Kurzweil 1000 series keyboards and expanders when the 250 is in Remote Mode.



send. You must enter the number from the numeric keypad. Once you've entered the number, pressing the SELECT button sends the program change.

*The List Editor*

## THE LIST EDITOR

The 250's List is a series of storage locations for Keyboard Setups.

In Play Mode, pressing the LIST button allows you to scroll through the list entries with the arrow keys. Pressing the SELECT button returns you to Play Mode and makes the current list entry the current Keyboard.

To edit the list, press the EDIT button and then press the LIST button. The top line of the display shows the current entry number in the list. The bottom line of the display shows the Keyboard Setup assigned to the current list entry. Use the up and down arrow keys to scroll through the Keyboard Setups and assign Setups to list entries. Use the left and right arrow keys to scroll through the list entries.

*The Bins Editor*

## THE KEYPAD BINS EDITOR

The Keypad Bins are 30 storage locations that can be used to store Keyboard Setups and sequences for instant recall. There are three bin banks each with 10 locations. Pressing the YES button calls up Bank 1, pressing the SELECT button calls up Bank 2, pressing the NO button calls up Bank 3.

In Play Mode, pressing one of the number keys on the numeric keypad (0-9) immediately calls up the Keyboard or sequence assigned to that Bin location. Pressing the YES, SELECT, or NO buttons calls up the appropriate Bin bank.

To edit the items stored in the bin locations, select the bin bank you want to edit and press the EDIT button. Then, select the bin location you want to edit by pressing its number on the numeric keypad. The 250 will ask you if you want to assign a Keyboard Setup or a sequence to the bin location. Press the KEYBOARD button to assign a Keyboard Setup. Press the SEQUENCE button to assign a sequence. Pressing the KEYBOARD button will allow you to select a Keyboard from the 250's

Keyboard memory. Pressing the SEQUENCE button will allow you to select a sequence from the 250's sequence memory. At this point, pressing the SELECT button assigns the chosen Keyboard or sequence to the bin location you originally selected.

*The Chorus Editor*

## THE CHORUS EDITOR

The Chorus Editor allows you to set the parameters for the 250's global chorus and delay effects.

Chorusing is a very common effect that uses a source sound and copy of that sound (in the case of the 250, extra voice channels playing the same sound at the same pitch) slightly detuned to thicken or, in general, enhance the source sound. Chorusing derives its name from the fact that it often sounds as though more than one instrument (a chorus of instruments) is playing at the same time.

*Be careful when programming with certain chorus options not to use up too many voice channels*

To enter the 250 Chorus Editor, press the EDIT button. Then, press the CHORUS button. The 250 will take you to CHORUS TYPE (CHOR 1).

Chorusing is a global effect which applies only to Keyboard Setups which do not already have individual chorus settings programmed. Keyboard Setups which incorporate Instruments with their own chorus settings will ignore the global settings established here in the Chorus Editor.

## CHORUS TYPE (CHOR 1)

Pressing the SELECT button when this item is in the display allows you to choose from the 250's five chorus types. Use the left and right arrow keys to scroll through the choices. The five chorus types are:

| | |
|---|---|
| DOUBLING | 1 |
| FULL CHORUS | 2 |
| FLANGING | 3 |
| ECHO | 4 |
| MICROTONAL | 5 |

DOUBLING uses an extra voice slightly detuned and delayed. DOUBLING is a stereo effect, each voice appears in a separate output

channel.

FULL CHORUS uses many extra voice channels, slightly detuned from the original voice and sounding in stereo. FULL CHORUS can potentially use all twelve 250 voice channels for a single note.

*The degree to which any stereo effect sounds in stereo depends on the positions of the two pan sliders. The closer each slider is to its center position, the less noticeable any stereo effect will be.*

FLANGING works best with short delay times (2 to 20 milliseconds) and low detune amounts (2 to 8 cents). FLANGING is a monophonic effect.

ECHO is just what it sounds like. Extra voice channels sound after the original at slightly lower volumes. The volume of the "echos" is controlled by the detune amount.

MICROTONAL chorusing works much like doubling except that the original voice doesn't sound. Only the detuned note is heard so only one voice channel is used.

## CHANNEL LIMIT (CHOR 2)

Pressing the SELECT button when this item is in the display allows you to select the total number of channels the 250 will use for the FULL CHORUS and ECHO effects, including the original note. Use the VALUE slider or enter the number from the numeric keypad. The higher the number, the more channel stealing will occur when chorusing is on. Channel limit only applies to FULL CHORUS and ECHO. It has no effect on the other chorus types.

*This parameter applies only to FULL CHORUS and ECHO.*

Be careful here. The 250 multiplies the total number of channels used in the original sound by the number you set here for this parameter. To see how this works call up Keyboard #11, DOUBLED ACCOUS. BASS (make sure SHOW CHANNELS is on in the Function Editor so you can see the number of voices being used). Set the chorus to FULL or ECHO and set the channel limit to 2. Return to Play Mode and play a note. With the chorus off, one key press triggers two voice channels. With chorus on, one key press triggers four voice channels.

## DETUNE (CHOR 3)

Pressing the SELECT button when this item is in the display allows you

to set the amount of detuning (in cents) for the chorus type you have chosen. Use the VALUE slider or enter a number from the numeric keypad. When you are editing for the ECHO type of chorusing, the detune amount controls the decay rate of the echos.

### DELAY (CHOR 4)

Pressing the SELECT button when this item is in the display allows you to set the delay amount (in milliseconds) for the type of chorusing you have chosen. Use the VALUE slider or enter a number from the numeric keypad.

### FACTORY DEFAULTS (CHOR 5)

*If you've really messed things up, use this menu item to get back to where you started.*

Pressing the SELECT button when this item is in the display allows you to return the chorus parameters to their default settings. The 250 will prompt you with the message: RESET TO FACTORY? Pressing the YES button resets all parameters of the currently selected chorus type to their factory settings. Pressing the NO button cancels the operation.

### EDITING THE CHORUS AS YOU PLAY

You can edit some chorus parameters in real time as you play on the 250. Pressing the CHORUS button when the 250 is in Play Mode turns on the chorus effect and displays the current chorus type and detuning and delay amounts. SLIDER #2 can be used to set the delay amount if you press SLIDER FUNCTION SELECT button #2. SLIDER #3 can be used to set the detune amount if you press the DETUNE button.

**CHORUS**

The settings you have made in the Chorus Editor (or the defaults, if you haven't changed them), define the units of change for detune and delay. For example, if you set detune to -12, then when you move SLIDER #3 (the DETUNE LED will be on), the detune amount will change in increments of 12 semitones. Note that since the detune setting was negative in this example, raising the slider will lower the resulting pitch of the detuned note(s).

*The Transpose Editor*

## THE TRANSPOSE EDITOR

The Transpose Editor allows you to choose from one of five 250 transposition modes that you can use in real time as you play. The five modes can be used to change pitch or timbre.

To enter the 250 Transpose Editor press the EDIT button. When the EDIT button is lit, pressing either TRANSPOSE button will allow you to select one of the five types of tranposition available on the 250. The five types are:

| | |
|---|---|
| OCTAVE PITCH SHIFT | 1 |
| CHROMATIC PITCH SHIFT | 2 |
| OCTAVE TRANSPOSE | 3 |
| CHROMATIC TRANSPOSE | 4 |
| TIMBRE SHIFT | 5 |

*Remember, in addition to transposing sounds, the 250's transposition options can also be used to create timbre changes.*

OCTAVE PITCH SHIFT moves the pitch of the 250 keyboard up or down by octaves. It does this by changing the sample playback rate. Therefore, it drastically alters the timbre of the sound you are playing. It has a limit of 1 octave up or 5 octaves down.

CHROMATIC PITCH SHIFT also moves the pitch of the 250 keyboard up or down by changing the sample playback rate but the pitch change occurs in half step increments and the maximum range is 1 octave up or down.

OCTAVE TRANPOSE simply moves the sound on the 250 keyboard up or down by octaves. Because the sample playback rate is unchanged the timbre of the instruments is unaffected. It has a limit of 2 octaves up or 5 octaves down.

CHROMATIC TRANSPOSE works exactly like OCTAVE TRANSPOSE but the pitch change is in half step increments and the maximum range is 1 octave up or down.

TIMBRE SHIFT is a special kind of transposition that can be very effective. TIMBRE SHIFT transposes not pitch but timbre. The higher the transposition, the brighter a sound will be. But the pitch will always remain the same. The timbre change is in half step increments and the range is 1 octave up or 3 octaves down.

Use the cursor keys to scroll through the options. Press the SELECT button to assign the desired type of transposition.

### SETTING THE TRANSPOSITION AS YOU PLAY

You can set the amount of transposition in real time as you play on the 250. Once the transposition type has been chosen, pressing either of the TRANSPOSE buttons when the 250 is in Play Mode transposes the keyboard and displays the interval of transposition in the display. Press both TRANSPOSE buttons simultaneously to remove all transposition.

## *The Assignable Controls*

### THE ASSIGNABLE CONTROLS EDITOR

The Assignable Controls Editor allows you to assign playback functions to the buttons and sliders in the ASSIGNABLE CONTROLS section of the front panel. To edit or view the assignments, press the EDIT button and then press the button that corresponds to the control you want to edit. The 250 will display the name of the control (followed by a "?") and its current assignment. Use the left and right arrow keys to scroll through the list of assignable controls and their assignments. To edit the assignment of any control scroll until it appears in the display and press the SELECT button (the name of the control will remain the same but the question mark will change to a colon). Now the left and right arrow keys can be used to scroll through the list of possible assignments.

There are 11 assignable controls:

SLIDER #1
SLIDER #2
SLIDER #3
LEFT LEVER
RIGHT LEVER
LEFT PEDAL
RIGHT PEDAL
EXTERNAL 1
EXTERNAL 2
EXPANSION 1 (not in use)
MONO PRESSURE (not in use)

There are 16 possible assignment functions:

| | |
|---|---|
| NO ASSIGNMENT | 0 |
| VIBRATO RATE | 1 |
| VIBRATO DEPTH | 2 |
| TREMOLO RATE | 3 |
| TREMOLO DEPTH | 4 |
| PITCH BEND | 5 |
| CHANNEL VOLUME | 6 |
| SEQUENCE VOLUME | 7 |
| MIDI IN VOLUME | 8 |
| SEQUENCE START | 9 |
| CHORUS DELAY | 10 |
| MUTE | 11 |
| SUSTAIN | 12 |
| BRIGHTNESS | 13 |
| MONO PRESSURE OUT | 14 (not in use) |
| VOLUME SWELL | 15 |
| PUNCH IN/OUT | 16 |

*Remember, no two controls can share the same assignment.*

Each Assignable Control can only be assigned to control one function. If you assign a control to a function already used by another control, the previously assigned control will revert to NO ASSIGNMENT. Also, you can reset all the controls to their default assignments by scrolling until you see the message: **FACTORY DEFAULTS?** Pressing the SELECT button displays the message: **RESET TO FACTORY?** At this point, pressing the YES button resets all assignable controls to their default assignments. Pressing the NO button cancels the operation.

# *The Data Cartridge*

RMX

## THE CARTRIDGE MENUS

While this is not a true editor, since you do not press the EDIT button before pressing the READ or SEND buttons, we have included it here in the chapter on the Play Editors because it is accessed while in Play Mode. This section applies only to K250 owners, since the 250 RMX is not fitted for the RAM Cartridge.

The menu items in the Cartridge Menus allow you to send and receive data using the K250's data cartridge. There are two sets of menus. The READ options perform operations such as loading information from

the cartridge into the K250, displaying information about the cartridge, and yodeling. The SEND options perform operations such as storing information from the K250, initializing, and naming the cartridge. The READ options can be accessed by pressing the READ button when the K250 is Play Mode. The SEND options can be accessed by pressing the SEND button when the K250 is in Play Mode.

You can use objects stored in the cartridge as though it were part of the K250. The only exceptions to this are Bins and Lists which must be read into the K250. This is because the K250 can have only one set of Bins and one List at any one time. Sequences, Keyboards, and Instruments are all accessed just as they are when they reside in the K250. There is one exception to this. The Sequencer Editor cannot edit sequences stored in the cartridge. You must return the sequence library to the K250 if you want to edit any of its sequences. Similarly, the Instrument and Keyboard Editors cannot change the objects in the cartridge. They can be read by the editors but not written back individually. In order to store edited versions back in the cartrdige you must save the entire library.

*The data cartridge is one of the new hardware options supported by the Version 6.0 software.*

Objects saved to the cartridge are automatically renumbered when they are installed. Sequences are renumbered from 50-89, Keyboards from 700-739, and Instruments from 700-747. When a library is moved from the K250 to the cartridge, Instrument references (from the Keyboards they are used in) are automatically renumbered as are sequence chains. Renumbering is done when the objects are returned to the K250. Digitizer Keyboards stored in the cartridge are also renumbered to start at 700.

*Even if you don't have a data cartridge you can still back up your 250 memory via MIDI system exclusive data.*

The cartridge can be backed up via QLS or a MIDI System Exclusive data dump.

The battery in the cartridge should last at least three years. When it does wear out, it can easily be replaced by the user. The battery is a lithium battery available at most Radio Shack stores. To replace the battery, remove the screws in the cartridge carefully, remove the old battery and replace it with the new one. If you are unsure about any part of this process call Kurzweil customer support for assistance.

The write- protect switch is located on the front of the cartridge. When the switch is thrown to the left (PROTECTED) the cartridge cannot be written to. When the switch is thrown to the right (UNPROTECTED)

the cartridge can be written to. You should always put the Cartridge in the protected mode when inserting it and removing it from the K250.

*Back up your cartridge before removing the battery for replacement.*

When you insert the cartridge into the slot underneath the K250 keyboard (right below middle C), do it gently. Slide the cartridge straight in until it meets with some resistance. A firm push at this point should move the cartridge in another quarter of an inch as the connector engages. To get the K250 to read the cartridge do a soft reset (4,5,SELECT). If the cartridge is already in the K250 when you power up this won't be necessary.

## *The Read Options*

### LOAD K250 BINS (READ 1)

Pressing the SELECT button when this item is in the display allows you to load a library of K250 bin assignments to replace the current bin assignments. Use the left and right arrow keys to scroll through the different bin libraries. Pressing the SELECT button loads the selected bin library into the K250.

### LOAD K250 LIST (READ 2)

Pressing the SELECT button when this item is in the display allows you to load a K250 List to replace the current List in memory. Use the left and right arrow keys to scroll through the different lists in the cartridge. Pressing the SELECT button loads the selected list into the K250.

### MOVE OBJECT TO K250 (READ 3)

Pressing the SELECT button when this item is in the display allows you to retrieve an object (any type of K250 data like a sequence or the Keyboard library) from the data cartridge and load it into the K250. Use the arrow keys to select the type of object you want to retrieve. There are 3 object types that can be loaded from this menu option:

SEQUENCE LIBRARY
SEQUENCE
KBD & INST LIBRARIES

Once you've selected the type of object you want to retrieve, pressing

*Remember, loading Keyboard, Instrument, and Sequence libraries will overwrite the libraries currently in memory.*

the SELECT button causes the K250 to ask you if it is OK to overwrite the existing object currently in the K250. Because the K250 has only one Keyboard library, for instance, loading a Keyboard library from the cartridge will erase the library in the K250.

### GET CARTRIDGE INFO (READ 4)

Pressing the SELECT button when this item is in the display allows you to view the amount of free space available on your data cartridge. The K250 will display the number of bytes used and the number of bytes available. Each cartridge contains approximately 262,000 bytes of information.

### VIEW CARTRIDGE (READ 5)

Pressing the SELECT button when this item is in the display allows you to view the individual items stored in your K250 data cartridge. Use the left and right arrow keys to scroll through the list of items.

### TEST CARTRIDGE (READ 6)

*Caution! Performing this operation erases all data in your cartridge.*

Pressing the SELECT button when this item is in the display allows you to perform a quick diagnostic test on your data cartridge. Peforming the test erases all data on the cartridge so it's a good idea to perform this operation when you first put your cartridge into the K250. During the test, the K250 will make several "passes" at the cartridge to test its memory thoroughly. On each pass it will report the number of errors (if any) that it encounters. The K250 will continue to test the cartridge until you press and hold the "R" button. If you encounter any errors in the testing process call Kurzweil customer support. You may have a defective cartridge.

### YODEL (READ 7)

Yodel is a secret algorithmic composition feature in the K250. To activate yodeling go to YODEL (READ 7). Play a chord on the K250 keyboard and depress the sustain pedal to hold the notes. Press the SELECT button and your K250 will begin to yodel with the current

Keyboard. To change the sound play a different chord press the YES and SELECT buttons and the yodel will change. Press the PLAY button to stop the yodel. What's actually happening is that the K250 is reading continuously at random from the its sound block memory.

With Yodel, entire film scores for horror movies can be composed in a single evening, entire symphonies can be created in seconds. Amaze your friends, confound your music teachers, drive your housemates crazy...with Yodel!

## *The Send Options*

### INSTALL OBJECT IN CART (SEND 1)

Pressing the SELECT button when this item is in the display allows you to install an object (any type of data in the K250) into the data cartridge for permanent storage. There are 6 types of data you can install. Use the left and right arrow keys to scroll through the list of objects:

SEQUENCE LIBRARY
SEQUENCE
KBD & INST LIBRARIES
BINS
MIDI LIST
1/2 DIGITIZER MEM

Installing an object in the cartridge does not remove it from the K250. The write-protect switch must be in the UNPROTECTED position when writing to the cartridge.

### REMOVE OBJECT FROM CART (SEND 2)

Pressing the SELECT button when this item is in the display allows you to remove (to erase) an object from the data cartridge. The K250 will prompt you for the type of object you want to remove. Use the left and right arrow keys to scroll through the list of objects. Once you've selected the kind of object you want to remove press the SELECT button. The K250 will now prompt you for the specific object to be removed. Use the left and right arrow keys to scroll through the list of objects. Pressing the SELECT button removes the object from the cartridge and displays the amount of space freed up by the removal.

## NAME CARTRIDGE (SEND 3)

Pressing the SELECT button when this item is in the display allows you to name your data cartridge. Use the ALPHA slider to select the letters and press the ALPHA button to move to the next character. Remember, if you make a mistake, pressing the red "R" button lets you start over again.

## INITIALIZE CARTRIDGE (SEND 4)

*Caution! Initializing a cartridge erases all of its data.*

Pressing the SELECT button when this item is in the display allows you to initialize the data cartridge. The K250 will prompt you with this message: **COMPLETELY ERASE?**. Pressing the YES button initializes the cartridge completely erasing all existing data. Pressing the NO button cancels the operation.

# *The Function Editor*

# 4

*Chapter Four*

# *The Function Editor*

## *Overview*

### DESCRIPTION

The Function Editor is so named because the menu items within it pertain, in general, to many of the 250's global functions. Inside the Function Editor you'll find options that allow you to specify how the 250 performs outside of the context of the other 250 editors.

A good example of this is the relationship between the 250's global effects settings here in the Function Editor and the local effects settings in the Instrument Editor. Within the Function Editor you can edit the 250's global brightness, tremolo, and vibrato settings among other things. These can be used to affect the current Performance Keyboard when you play the 250 as a single performance instrument. Within the Instrument Editor these same effects can be edited on a local basis (for each Instrument). At any time, however, you can elect to apply the current global settings to an individual Instrument by using Capture Effects Settings (INST 9).

*Individual outputs can also be assigned by Keyboard region.*

A similar relationship exists between the Function Editor and the Keyboard Editor with regard to individual output assignments. Assignments can be made here in the Function Editor for the Performance Keyboard—whatever Keyboard Setup you are playing on your 250's own keyboard (or the MIDI controller driving your RMX). Or you can use the Function Editor to allow individual Keyboard Setups to determine their own output channels.

The Function Editor also contains several general utility features like the Maintenance options which can help you trouble shoot your 250 when problems arise, and the MIDI System Exclusive options which you can use to back up important data over MIDI. There are also options pertaining to keyboard dynamic response, channel stealing, sustain pedal operation, and other options which pertain to the 250's general operation and which fall outside the context of the other 250 editors.

Many of the Function Editor menus will prompt you to select a source channel—the portion of the 250 which will use the assignments you make. There are 29 source channels: the Performance Keyboard (or your MIDI controller if you are using the RMX), the 12 sequencer tracks, and the 16 MIDI channels. Each of these source channels can have its own assignments independent of the others.

**RMX**

*Main Menus*

### RMX / 250 SETUP (1)

This menu item is primarily for RMX owners who want to take advantage of the assignable controls on their units.

### SEPARATE OUTPUTS (2)

This menu is used to set the output channel assignments for 250 owners who have the individual outputs option.

### PRESSURE (3)

The menu choices under PRESSURE (3) perform operations such as selecting a MIDI channel (PRES 1) and setting mono and poly pressure function (PRES 2 and PRES 3). This option is for receiving pressure signals from external devices only; the 250 does not send pressure.

### SUSTAIN TYPE (4)

This menu item is used to change the way the 250 responds to the sustain pedal.

## BRIGHTNESS (5)

The menu choices under BRIGHTNESS (5) perform operations such as setting the brightness level, threshold, and dynamic range (BRT 1, BRT 2, and BRT 3), and turning aliasing on and off (BRT 4).

## KEYBOARD DYNAMICS (6)

This menu item is used to adjust the 250's sensitivity to velocity information.

*The factory defaults for the Function Editor parameters for functions like Brightness, Keyboard Dynamics, and Channel Stealing have been carefully chosen by the Kurzweil engineers. In most cases, they wilil not need to be edited.*

## TREMOLO (7)

The menu choices under TREMOLO (7) perform operations such as selecting a tremolo channel (TREM 1), setting the LFO waveform (TREM 2), setting the LFO rate and depth multipliers (TREM 3 and TREM 4), setting the LFO delay (TREM 5), and synchronizing LFOs (TREM 6).

## VIBRATO (8)

The menu choices under VIBRATO (8) perform operations such as selecting a vibrato channel (VIB 1), setting the LFO waveform (VIB 2), setting the LFO rate and depth multipliers (VIB 3 and VIB 4), setting the LFO delay (VIB 5), and synchronizing LFOs (VIB 6).

## PITCH BEND (9)

The menu choices under PITCH BEND (9) perform operations such as selecting the pitch bend channel (BEND 1), setting the pitch bend interval (BEND 2), and setting the pitch bend direction (BEND 3).

## CHANNEL STEALING (10)

The menu choices under CHANNEL STEALING (10) perform operations such as setting the 250 to steal the least or oldest and highest or

lowest note (STL 1 and STL 2), turning the STEAL SAME NOTE FIRST option on and off (STL 3), stealing ahead with or without sustain (STL 4 and STL 5), setting channel off volume and release rate (STL 6 and STL 7), and stealing for chorus notes (STL 8).

### MAINTENANCE (11)

The menu choices under MAINTENANCE (11) perform operations such as setting bus assignments (MNT 1), enabling and disabling channels (MNT 2), turning controllers on and off (MNT 3), and displaying the version number of your 250 software (MNT 4), enabling and disabling the Keyboard preview feature (MNT 5), and turning confirmation on and off (MNT 6).

### SYSTEM EXCLUSIVE (12)

The menu choices under SYSTEM EXCLUSIVE (12) perform operations such as dumping system exclusive data (SYSX 1), setting the system exclusive ID (SYSX 2), and setting the echo display status to send the display out over MIDI (SYSX 3).

### SWELL RANGE (13)

This item is used to adjust the 250's sensitivity to volume information.

*Reference Guide*

### RMX / 250 SETUP (1)

Pressing the SELECT button when this item is in the display allows you to make the 250's assignable controls available on the 250's basic channel. The 250 will prompt you with this message: **CTLS ON BASIC CHANNEL**. Use the left and right arrow keys to toggle between setting the controls OFF (not available over the basic MIDI channel) or ON (available over the basic MIDI channel).

**RMX**

This option is included for RMX users. If you have an RMX set CTLS ON BASIC CHANNEL to ON. When CTLS ON BASIC CHANNEL is ON the 250 controls will have no effect locally. The assignable controls (the three vertical sliders on the RMX) can be used as if they were

coming in via MIDI—on the basic channel. This disables the local control of effects on the Performance Keyboard so don't use this with the K250.

NOTE: You should only change the default setting (Off) if you own an RMX. Doing this will enable your RMX to respond to incoming MIDI controller information. K250 owners should leave this paramater alone.

## SEPARATE OUTPUTS (2)

Pressing the SELECT button when this item is in the display allows you to assign any of the 29 audio sources on the 250 (the current Performance Keyboard, the 12 sequencer tracks, and the 16 MIDI channels) to one or several of the 250's 12 monophonic individual output channels.

## ASSIGN CHANNELS (SO 1)

*Using the individual outputs will improve the sound of your 250.*

Pressing the SELECT button when this item is in the display causes the 250 to display the message: PERFORMANCE KBD? Use the left and right arrow keys to scroll through the 29 audio sources until you find the one you want to assign. You can use the 16 buttons on the left side of the front panel to select MIDI channels, and the Mixboard buttons to select sequence tracks. Pressing the SELECT button allows you to set the assignment for a particular source. Assignments can be made on the basis of Keyboard regions (as defined in SET OUTPUTS FOR REGION (KBD 22) in the Keyboard Editor) or a single global assignment can be made for each audio source.

*Remember, these are monophonic outputs.*

When you've selected the source you want to assign, the display will look something like this (if you had chosen PERFORMANCE KBD it would look exactly like this): PERFORMANCE KBD: KEYBOARD REGIONS. KEYBOARD REGIONS is the default assignment for every audio source. Within the Keyboard Editor each region of a Keyboard can be assigned to an individual output or group of outputs. These output assignments will be in effect unless they are overridden here in the Function Editor.

To override assignments made in the Keyboard Editor and apply global channel assignments press the SELECT button. The 250 will display the numbers 1 through 9 and the letters A through C (for

channels 10, 11, and 12). The lights on the Mixboard buttons (the 6 pairs of buttons in the lower right corner of the front panel) will also come on. Initially, all sources are assigned to all channels. To assign a source to a particular output you must disable all the other channels. You can do this by pressing the appropriate Mixboard buttons to turn their lights off. The corresponding numbers and letters in the display will also be turned off. When you have disabled the appropriate channels, pressing the SELECT button sets the assignment.

## WHAT'S A MONOPHONIC OUTPUT?

*Before you work with the individual outputs you should read this section carefully.*

The 12 individual outputs on the back of the 250 are monophonic outputs. This means that only one voice (literally one note) can appear at an output at one time. (By contrast, the main stereo outputs of the 250 are polyphonic outputs). Because only one voice can appear at any output, polyphonic parts must use several individual outputs even if the sound is the same in each one. This is best explained by example. When the 250 Grand Piano is assigned to output A of the main outputs (in the Instrument Editor SET OUTPUT GROUP (INST 10)), every note you play on the Grand Piano comes out of output A. If you only had one channel on your mixer you would still be able to hear every piano note you played. If, however, you assign the Grand Piano to one of the individual outputs you will only hear one note at any given moment.

*If your Mixboard lights do not light up when you play a key, make sure SHOW CHANNELS is on in the Function Editor.*

The reason for this is that the 12 individual outputs are intimately linked to the 12 output channels. Whenever a 250 voice channel is activated, the sound that that channel produces appears at its corresponding individual output. Try this: play quarter notes on middle C over and over again and watch the lights on the Mixboard go on and off. Notice how each time you play a note a different Mixboard light goes on. Each light on the Mixboard represents the activity of a single 250 voice channel. The sound produced by that channel appears at its corresponding individual output. Even though you are playing the same note over and over, a different channel is being activated each time, and the sound is appearing at a different individual output. That's the way monophonic outputs behave—the more notes you play, the more outputs you need.

There is a favorable interaction between the 250's polyphonic stereo outputs and the 12 individual monophonic outputs. When an audio

*Understanding monophonic outputs can be a little hard at first. Make sure you've connected all 12 individual outputs and the two main outputs to a mixing board before you start. Then, remove plugs as necessary to achieve the effect you want.*

cable is plugged into an individual output that voice conveniently disappears from the main outputs. This means that it is possible, with careful planning, to assign up to two polyphonic Instruments at a time (one to each of the stereo outputs) and use the remaining voice channels and their individual outputs for monphonic Instruments, and still be able to process each Instrument sound through its own channel on a mixing board.

All Keyboards are initially assigned to one of the stereo outputs (in SET OUTPUT GROUP (INST 10)) and all of the individual outputs (in SET OUTPUTS FOR REGION (KBD 22)). To put the Trumpet (Keyboard 600) on its own channel (and its own output) you must disable all the other channels for that Keyboard and you must disable the channel the Trumpet is using on every other Keyboard that will be playing along with it. If you don't disable the Trumpet's channel on all the other instruments, any other instrument that can use the channel the Trumpet is using will fight with the Trumpet for the use of the output and the one note of polyphony assigned to it.

Here's an example that should give you an idea of how best to assign 250 Keyboards in multi-part compositions. Take a typical jazz combo with piano, bass, and drums (bass drum, snare drum, open hi hat, closed hi hat, toms, and ride cymbal). Put the bass on channel 1, the bass drum on channel 2, the snare on channel 3, the open hi hat and the closed hi hat on channel 4, all of the toms on channel 5, the ride cymbal on channel 6, and the piano on channels 7 through 12. If audio cables are plugged into individual outputs 1-6 (and 7-12 are empty) then the piano will appear, all by itself, in one of the main stereo outputs and the other voices will appear each at their own channel as assigned. The bass and each of the drum sounds will get one output and one note of polyphony each. In the case of the hi hats this will cause them to cut each other off just like a real drummer (a real drummer can't play an open and a closed hi hat at the same time). The piano will get 6 notes of polyphony and because there are cables plugged into the first 6 channels (and not into the next 6) it will appear all by itself in whichever of the stereo outputs it has been assigned to in the Instrument Editor. No problems so far, but what if we wanted to add another polyphonic instrument like Vibes? The best thing to do would be to assign the Vibes to channels 6-12 along with the Piano but set its output group assignment to use the opposite channel on the stereo outputs. Pan the INSTRUMENT GROUP A and INSTRUMENT GROUP B sliders as far to the left and right as possible. This will

separate the two instruments completely. When the Piano and the Vibes play at the same time, channel stealing will occur because they are assigned to the same 250 voice channels. But they will only steal from each other, (the other voices will not be affected) and because the Piano and Vibes are assigned to different output groups they will appear at different stereo outputs. If, at this point, you wanted to add a solo sax, the best thing to do would be to assign the sax to channel 7 (plug a cable into output 7 to remove it from the stereo outputs) and disable channel 7 on both the Piano and the Vibes. If you wanted to add another polyphonic instrument it would probably be best to have it share channels with the Piano and the Vibes and route it to one of the main stereo outputs. In general, use the main outputs as though they were a pair of polyphonic instruments and use the individual outputs for monophonic instruments.

## SHOW CHANNELS (SO 2)

Pressing the SELECT button when this item is in the display allows you to enable and disable the Mixboard channel display. Use the left and right arrow keys to turn this option On or OFF. When this option is ON channel activity will be displayed via the lighting of the Mixboard buttons. When this option is OFF channel activity will not be displayed.

NOTE: This is not the same as the Sequencer Mixboard which displays the number of tracks in a sequence and can be enabled and disabled while in Play Mode by pressing the SEARCH button. If the Sequencer Mixboard is activated, the channel LEDs will not light.

## PRESSURE (3)

Pressing the SELECT button when this item is in the display takes the user to SELECT MIDI CHANNEL (PRES 1).

## SELECT MIDI CHANNEL (PRES 1)

Pressing the SELECT button when this item is in the display allows you to select the MIDI channel that the 250 will look to for monophonic (channel pressure or aftertouch) and polyphonic pressure commands.

Use the left and right arrow keys to scroll through the list of MIDI channels (1-16). Press the SELECT button to make the assignment.

## MONO PRESSURE FUNCTION (PRES 2)

Pressing the SELECT button when this item is in the display allows you to select a function for incoming monophonic pressure commands. Use the left and right arrow keys to scroll through the list of function assignments. Monophonic pressure can be used to control the following items:

| | | |
|---|---|---|
| NO ASSIGNMENT | 0 | |
| VIBRATO RATE | 1 | |
| VIBRATO DEPTH | 2 | |
| TREMOLO RATE | 3 | |
| TREMOLO DEPTH | 4 | |
| PITCH BEND | 5 | |
| CHANNEL VOLUME | 6 | |
| SEQUENCE VOLUME | 7 | |
| MIDI IN VOLUME | 8 | |
| SEQUENCE START | 9 | |
| CHORUS DELAY | 10 | |
| MUTE | 11 | |
| SUSTAIN | 12 | |
| BRIGHTNESS | 13 | |
| MONO PRESSURE OUT | 14 | (Not in use) |
| VOLUME SWELL | 15 | |
| PUNCH IN/OUT | 16 | |

Pressing the SELECT button assigns the monophonic pressure function.

## POLY PRESSURE FUNCTION (PRES 3)

Pressing the SELECT button when this item is in the display allows you to select a function for incoming polyphonic pressure commands. Use the left and right arrow keys to scroll through the list of function assignments. Polyphonic pressure can be used to control the following items:

| | |
|---|---|
| NO ASSIGNMENT | 0 |
| NOTE VOLUME | 1 |
| BEND NOTE UP | 2 |
| BEND NOTE DOWN | 3 |

Pressing the SELECT button assigns the polyphonic pressure function.

## SUSTAIN TYPE (4)

Pressing the SELECT button when this item is in the display allows you to alter the way the 250 responds to the sustain pedal. Use the left and right arrow keys to toggle between the two sustain types:

| | |
|---|---|
| SUSTAINED RELEASE | 0 |
| STANDARD | 1 |

STANDARD is the type of release we're all used to. When STANDARD is selected, depressing the sustain pedal sustains any notes that have been turned on; releasing the sustain pedal turns them off. STANDARD is the factory default setting.

*Give this a try. It's kind of interesting.*

SUSTAINED RELEASE is a little different. When SUSTAINED RELEASE is selected, depressing the sustain pedal sustains any notes that have been turned on, but releasing the sustain pedal and depressing it again rapidly (as is common in piano performance) allows you to "catch" the sound again at a later point in the release segment of its envelope. Successive pedaling allows you to repeatedly capture later sections of the release.

## BRIGHTNESS (5)

Pressing the SELECT button when this item is in the display takes the user to SET BRIGHTNESS LEVEL (BRT 1). On each voice channel of the 250 there is a low-pass filter. A low-pass filter is so named because it allows low frequencies to pass through. As the filter closes down only progressively lower frequencies are allowed to pass through. As the filter opens up progressively higher frequencies may pass. The Brightness options on the 250 give you control over the state of the 250's low-pass filters.

## SET BRIGHTNESS LEVEL (BRT 1)

Pressing the SELECT button when this item is in the display allows you to set the Brightness Level. Use the VALUE slider or enter a number from the numeric keypad.

*Remember, if you enter a value with the numeric keypad you must press the SELECT button twice in a row.*

Editing the Brightness Level is like opening and closing the 250's low-pass filters. The higher the Brightness Level, the brighter the 250 will sound because progressively higher frequencies will be allowed to pass through the filters.

You can set the Brightness Level without going into the Function Editor by using SLIDER #3 on the front panel. Enable SLIDER #3 by pressing SLIDER SELECT Button #3, then move SLIDER #3 up and down. As you move the slider up, play a few notes on the keyboard. The sound will brighten as the slider reaches the top and darken as it reaches the bottom. When you do this you'll be setting the Brightness Level. Disabling SLIDER #3 by pressing SLIDER SELECT Button #3 again causes the Brightness Level to return to 0.

## SET BRIGHTNESS THRESH (BRT 2)

Pressing the SELECT button when this item is in the display allows you to set theBrightness Threshold. Use the VALUE slider or enter a number from the numeric keypad. Brightness can be controlled dynamically from the keyboard by attack velocity. Increasing the Brightness Threshold increases that control by making the low-pass filters open up when you play harder.

## BRIGHT DYNAMIC RANGE (BRT 3)

Pressing the SELECT button when this item is in the display allows you to adjust the Brightness Dynamic Range. Use the VALUE slider or enter a number from the numeric keypad. The Brightness Dynamic Range determines exactly how much brighter (or darker) the sound will become as you play harder on the keyboard. Positive numbers will make the sound brighter as you play harder. Negative numbers will make the sound darker as you play harder.

## ALIASING ON/OFF (BRT 4)

Pressing the SELECT button when this item is in the display allows you to determine whether the 250's filters will automatically close down when aliasing is detected. Use the left and right arrow keys to toggle between setting aliasing ON or OFF.

*If your brightness settings are high, turn off aliasing for a better sound.*

Aliasing is usually characterized by a high pitched buzzing sound. Also called "fold over", aliasing is a type of digital distortion that results from the presence of audio frequencies that exceed the 250's bandwidth. In general, aliasing is a very unmusical effect. The factory default setting for aliasing is ON, but your 250 may sound better in certain situations if you turn aliasing OFF.

To get an idea of the difference, set the Brightness Level to 4800 (the highest setting) and play the Kurzweil Grand Piano from middle C on down. Do you hear that buzzing sound? That's aliasing. Now, go into the Function Editor, arrow over to ALIASING ON/OFF (BRT 4) and turn aliasing OFF. Now play the Grand Piano again. No more buzzing, right? Experiment with other sounds and other settings for the Brightness Level. In general, the brighter and clearer a sound is, the more people like it.

## KEYBOARD DYNAMICS (6)

Pressing the SELECT button when this item is in the display allows you to edit the 250's overall velocity sensitivity. Use the VALUE slider or the numeric keypad to enter a number from 1 through 11. The higher the number the more sensitive the 250 will be to attack velocity. At a level of 1 even the slightest touch on a key will produce the loudest sound possible. At a value of 11 it takes a very hard key strike to produce the loudest sound. Acoustic instruments have tremendous dynamic range. Higher values for Keyboard Dynamics increase the dynamic range of the 250, making it respond more like real orchestral instruments.

## TREMOLO (7)

Pressing the SELECT button when this item is in the display takes you to SELECT TREMOLO CHANNEL (TREM 1). Tremolo is the constant

modulation of sound's amplitude (in contrast to vibrato which is pitch modulation).

## SELECT TREMOLO CHANNEL (TREM 1)

*Some instruments sound good with tremolo. Others sound good with vibrato. Rarely will an acoustic instrument sound good with both.*

Pressing the SELECT button when this item is in the display allows you to route the 250's global tremolo to either the Performance Keyboard, any of the 12 sequencer tracks, or any of the 16 MIDI channels. Use the left and right arrow keys or front panel buttons to scroll through the list of sources.

## LFO WAVEFORM (TREM 2)

Pressing the SELECT button when this item is in the display allows you to select the LFO waveform for the tremolo effect. Use the left and right arrow keys to scroll through the list of LFO waveforms. The available LFO waveforms are:

| | |
|---|---|
| NO LFO | 0 |
| TRIANGLE +/- | 1 |
| SQUARE +/- | 2 |
| ASCENDING RAMP +/- | 3 |
| DESCENDING RAMP +/- | 4 |
| TRIANGLE + | 5 |
| SQUARE + | 6 |
| ASCENDING RAMP + | 7 |
| DESCENDING RAMP + | 8 |
| TRIANGLE - | 9 |
| SQUARE - | 10 |
| ASCENDING RAMP - | 11 |
| DESCENDING RAMP - | 12 |

The best way to get a feel for what each waveform sounds like is to apply them one at a time and listen to them with several different sounds. Sustaining sounds like organs and strings will work the best.

## LFO RATE MULTIPLIER (TREM 3)

Pressing the SELECT button when this item is in the display allows you

to set the LFO Rate Multiplier for the tremolo effect. Use the VALUE slider or enter a number from the numeric keypad. The LFO Rate Multiplier can be used to increase or decrease the Tremolo Rate. Higher values make the tremolo faster, lower values make the tremolo slower. This works in conjunction with any assignable control you may have set to control the tremolo rate.

## LFO DEPTH MULTIPLIER (TREM 4)

Pressing the SELECT button when this item is in the display allows you to set the LFO Depth Multiplier for the tremolo effect. Use the VALUE slider or enter a number from numeric keypad. The LFO Depth Multiplier can be used to increase or decrease the tremolo depth. Higher values increase the amount of amplitude modulation, lower values decrease the amount of amplitude modulation. This also works in conjunction with assignable controls.

## LFO DELAY (TREM 5)

*Most acoustic instruments will sound better when a slight amount of delay is applied to the tremolo effect.*

Pressing the SELECT button when this item is in the display allows you to set the LFO Delay. Use the VALUE slider or enter a number from the numeric keypad. The longer the delay the more time will elapse before the tremolo effect begins.

## SYNCHRONIZE LFOS (TREM 6)

Pressing the SELECT button when this item is in the display allows you to enable or disable LFO synchronization. You can use the left and right arrow keys to toggle synchronization ON or OFF. Each of the 250's 12 voice channels has an LFO (a Low Frequency Oscillator) of its own. These 12 LFOs can be set to work together (in sync) or independently. When the LFOs are synchronized, each time a voice channel is activated its LFO will modulate in sync with any other LFOs that are on. All LFOs will pulse together and the tremolo effect will appear quite strong. If the LFOs are not synchronized, each time a voice channel is activated its LFO will modulate independently of any other voice channel.

## VIBRATO (8)

*Vibrato is pitch modulation. Tremolo is amplitude modulation.*

Pressing the SELECT button when this item is in the display takes the user to SELECT VIBRATO CHANNEL (VIB 1). Vibrato is the constant modulation of sound's pitch (in contrast to tremolo which is amplitude modulation).

## SELECT VIBRATO CHANNEL (VIB 1)

Pressing the SELECT button when this item is in the display allows you to route the 250's global vibrato to either the Performance Keyboard, any of the 12 sequencer tracks, or any of the 16 MIDI channels. Use the left and right arrow keys to scroll through the list of sources.

## LFO WAVEFORM (VIB 2)

Pressing the SELECT button when this item is in the display allows you to select the LFO waveform for the vibrato effect. Use the left and right arrow keys or front panel buttons to scroll through the list of LFO waveforms. The available LFO waveforms are:

*A triangel waveform will probably work best for acoustic instrument vibrato.*

| | |
|---|---|
| NO LFO | 0 |
| TRIANGLE +/- | 1 |
| SQUARE +/- | 2 |
| ASCENDING RAMP +/- | 3 |
| DESCENDING RAMP +/- | 4 |
| TRIANGLE + | 5 |
| SQUARE + | 6 |
| ASCENDING RAMP + | 7 |
| DESCENDING RAMP + | 8 |
| TRIANGLE - | 9 |
| SQUARE - | 10 |
| ASCENDING RAMP - | 11 |
| DESCENDING RAMP - | 12 |

The best way to get a feel for what each waveform sounds like is to apply them one at a time and listen to them with several different sounds. Solo instrument sounds like baritone horn and flute will work the best.

## LFO RATE MULTIPLIER (VIB 3)

Pressing the SELECT button when this item is in the display allows you to set the LFO Rate Multiplier for the vibrato effect. Use the VALUE slider or enter a number from numeric keypad. The LFO Rate Multiplier can be used to increase or decrease the vibrato rate. Higher values make the vibrato faster, lower values make the vibrato slower. This works in conjunction with any assignable control you may have set to control the vibrato rate.

## LFO DEPTH MULTIPLIER (VIB 4)

Pressing the SELECT button when this item is in the display allows you to set the LFO Depth Multiplier for the vibrato effect. Use the VALUE slider or enter a number from the numeric keypad. The LFO Depth Multiplier can be used to increase or decrease the vibrato depth. Higher values increase the amount of pitch modulation, lower values decrease the amount of pitch modulation. This also works in conjunction with assignable controls.

## LFO DELAY (VIB 5)

*Almost all instruments will benefit from some LFO delay.*

Pressing the SELECT button when this item is in the display allows you to set the LFO Delay. Use the VALUE slider or enter a number from the numeric keypad. The longer the delay the more time will elapse before the vibrato effect begins. Most acoustic sounds will benefit from a slight LFO delay.

## SYNCHRONIZE LFOS (VIB 6)

Pressing the SELECT button when this item is in the display allows you to enable or disable LFO synchronization. You can use the left and right arrow keys to toggle synchronization ON or OFF. Each of the 250's 12 voice channels has an LFO (a Low Frequency Oscillator) of its own. These 12 LFOs can be set to work together (in sync) or independently. When the LFOs are synchronized, each time a voice channel is activated its LFO will modulate in sync with any other LFOs that

are on. All LFOs will pulse together and the vibrato effect will appear quite strong. If the LFOs are not synchronized, each time a voice channel is activated its LFO will modulate independently of any other voice channel.

### PITCH BEND (9)

Pressing the SELECT button when this item is in the display takes the user to SELECT PITCH BEND CHANNEL (BEND 1).

### SELECT PITCH BEND CHANNEL (BEND 1)

Pressing the SELECT button when this item is in the display allows you to route pitch bend to either the Performance Keyboard or any of the 16 MIDI channels. Use the left and right arrow keys to scroll through the list of sources.

### BEND INTERVAL (BEND 2)

*A whole step or a minor third are probably the most useful bend intervals for live performance.*

Pressing the SELECT button when this item is in the display allows you to enter the maximum pitch bend amount. Use the VALUE slider or enter a number from numeric keypad. The range can be set in half steps from 1 to 60. The range refers to the maximum amount of pitch bend on each side of the center detent position. A range of 2 halfsteps means that it is possible to bend up a whole step and down a whole step.

### BEND DIRECTION (BEND 3)

Pressing the SELECT button when this item is in the display allows you to determine in what direction the pitch will bend when the control is used. You can use the left and right arrow keys to toggle between the two choices: push **TO BEND UP** and **PULL TO BEND UP**. If you select **PUSH TO BEND UP** the pitch will bend up when you push the pitch bend wheel away from you. If you select **PULL TO BEND UP** the pitch will bend UP when you pull the pitch bend wheel toward you. **PUSH TO BEND UP** is recognized as the standard on virtually all keyboards.

## CHANNEL STEALING (10)

Pressing the SELECT button when this item is in the display allows you to modify the 250's channel stealing alogorithm. The 250 is capable of playing 12 different sounds simultaneously but it often seems as though you can play many more. That's because of a process called channel stealing. When the 12-note limit is reached the 250 must turn off old notes to allow new ones to play. How the 250 decides which notes get turned off is determined here.

*For an application-oriented discussion of Channel Stealing, see the appropriate chapter in Volume One.*

Before you change these settings there are two things you should be aware of. First of all, channel stealing can be a bit complicated. After all, if it's being done well you can't really hear it going on. Second, the factory default settings have been well thought out and probably won't ever need to be adjusted. You'll be amazed at how effective the 250's channel stealing is. To test it out, hold down the sustain pedal, play an octave at the bottom end of the Grand Piano with your left hand, and play a rapid glissando across all the white notes from middle C on up. Even though you will trigger more than 40 notes (keep the sustain pedal down) the sound will be very convincing.

Here are the eight parameters of the channel stealing algorithm.

### STEAL LEAST OR OLDEST (STL 1)

Pressing the SELECT button when this item is in the display tells the 250 you want it to steal either the note with the least volume or the oldest note. Use the left and right arrow keys to toggle between the two options. The default is least volume.

### PRESERVE HIGH AND LOW (STL 2)

If this option is ON the 250 will always preserve the highest and lowest notes being played. Use the left and right arrow keys to toggle between ON or OFF. The default is ON.

### STEAL SAME FIRST NOTE (STL 3)

If this option is ON the 250 will steal the same note before stealing

others if the identical note is present. This is good in passages with many repeated notes. Use the left and right arrow keys to toggle between ON or OFF. The default is OFF.

### STEAL AHEAD WITH SUSTAIN (STL 4)

This option determines when channel stealing will begin if the sustain pedal is down. Pressing the SELECT button when this item is in the display causes the 250 to prompt you with the message: **HOW MANY FREE CHANNELS**. Use the VALUE slider to enter a number from 0 through 11. The number of channels you choose determines when stealing will begin if the sustain pedal is down. If you choose three channels then stealing will begin when there are only 3 voice channels left. The default is 0.

### STEAL AHEAD WITHOUT SUSTAIN (STL 5)

This option is identical to the previous one except that the number entered here tells the 250 when to begin channel stealing when the sustain pedal is not down. The default is 0.

### CHANNEL OFF VOLUME (STL 6)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you to enter the channel off volume (in dB) at which stealing will begin based on the settings of the two previous options. Use the VALUE slider to enter a number from 0 through 85. Higher volumes produce more noticeable stealing. The default setting is 25db.

### STEAL RELEASE RATE (STL 7)

Pressing the SELECT button when this item is in the display allows you to determine how fast notes are stolen. Use the VALUE slider to enter a number from 1 through 3600. The number you enter (in db/sec) determines how fast the 250 will turn off an old note before allowing a new one to take its place. The default is 3600 db/sec.

### STEAL FOR CHORUS NOTES (STL 8)

If this option is ON, those notes used for chorusing effects will be stolen before non-chorused notes. The default setting is OFF.

### MAINTENANCE (11)

Pressing the SELECT button when this item is in the display takes the user to BUS OUTPUTS (MNT 1).

### BUS OUTPUTS (MNT 1)

Pressing the SELECT button when this item is in the display allows you to temporarily disable audio output B. Normally, both output buses are active but you may want a quick way to get all sounds (regardless of their bus assignment in the Keyboard Editor) to come out of output A. You can use the left and right arrow keys to toggle between **BOTH BUSES** (normal operation) and **BUS A ONLY**.

### CHANNELS ON/OFF (MNT 2)

Pressing the SELECT button when this item is in the display allows you to disable any or all of the 250's 12 voice channels. Use the twelve buttons at the lower right corner of the front panel to disable the channels. Pressing one of the buttons turns its light off, takes the appropriate channel number out of the display, and temporarily disables the voice channel. The only time you might want to do this is when a particular channel has been damaged.

### CONTROLLERS ON/OFF (MNT 3)

Pressing the SELECT button when this item is in the display allows you to disable all assignable controllers. If this option is OFF, the 250's sliders, wheels, and pedals will not work. Again, the only time you might want to use this is when a particular controller is not working properly.

## SHOW VERSION (MNT 4)

*If some of the options in this manual are not available to you it may be because you do not have Version 6.0 of the 250 software.*

Pressing the SELECT button when this item is in the display calls up the version number of your 250. If some of the features in this manual are not present on your K250 or RMX you may be using a different version of the 250. This manual has been prepared for Version 6.0. If you need information about which features come with which version of the 250, check the version number here and call Kurzweil customer support. They can tell you which version of the 250 software you need.

## KEYBOARD PREVIEW (MNT 5)

Pressing the SELECT button when this item is in the display allows you to set the 250's Keyboard Preview mode. Use the left and right arrow keys to toggle Keyboard Preview ON or OFF. When Keyboard Preview is ON (the default condition) you will hear the result of a front panel Keyboard change as soon as that change is made with the arrow keys or the numeric keypad. When Keyboard Preview is OFF you will not hear the result of a front panel Keyboard change until you press the SELECT button after the chosen Keyboard has appeared in the display.

## CONFIRMATION ON/OFF (MNT 6)

Pressing the SELECT button when this item is in the display allows you to enable and disable the 250's optional confirmation messages. Use the left and right arrow keys to toggle confirmation ON or OFF. Whenever you modify data that is stored in one of the 250's libraries you will be prompted to save any changes you have made before exiting. If Confirmation is ON (the default condition) you will be prompted for confirmation every time you exit. If Confirmation is OFF you may not be prompted for confirmation. In that case you will have to take responsibility for saving your work before exiting. We recommend leaving Confirmation ON at all times.

## SYSTEM EXCLUSIVE (12)

Pressing the SELECT button when this item is in the display takes the user to DUMP SYSX DATA (SYSX 1). MIDI System Exclusive data

(Sysex data) is a narrowly defined data stream which will be received by only those devices which are programmed to have a system exclusive device ID number matching that of the transmitting device. A Sysex data dump is the transmission of system exclusive data from one MIDI device (in this case the 250) to another (a computer or any other device that is capable of recording and storing sysex data). This option gives you the ability to store and recall any data in your Kurzweil (Keyboards, sequences, bins, lists, MIDI settings, etc... everything except digitized soundfiles) using an external device.

### DUMP SYSX DATA (SYSX 1)

Pressing the SELECT button when this item is in the display takes you to KBD LIBRARY (DMP 1).

### KBD LIBRARY (DMP 1)

Pressing the SELECT button when this item is in the display sends the contents of the 250's Keyboard library out over MIDI as a system exclusive data dump. If no receiving device responds the 250 will hang. Use a soft reset (4, 5, SELECT) to bring the 250 back to life.

### INST LIBRARY (DMP 2)

Pressing the SELECT button when this item is in the display sends the contents of the 250's Instrument library out over MIDI as a system exclusive data dump. If no receiving device responds the 250 will hang. Use a soft reset (4, 5, SELECT) to bring the 250 back to life.

### SEQ LIBRARY (DMP 3)

Pressing the SELECT button when this item is in the display sends the contents of the 250's Sequence library out over MIDI as a system exclusive data dump. If no receiving device responds the 250 will hang. Use a soft reset (4, 5, SELECT) to bring the 250 back to life.

### CONTROLLERS (DMP 4)

Pressing the SELECT button when this item is in the display sends the settings of the 250's Assignable Controllers out over MIDI as a system exclusive data dump. If no receiving device responds the 250 will hang. Use a soft reset (4, 5, SELECT) to bring the 250 back to life.

### MIDI SETTINGS (DMP 5)

Pressing the SELECT button when this item is in the display sends the 250's MIDI settings out over MIDI as a system exclusive data dump. If no receiving device responds the 250 will hang. Use a soft reset (4, 5, SELECT) to bring the 250 back to life.

### SETUP LIST (DMP 6)

Pressing the SELECT button when this item is in the display sends the contents of the 250's Setup List out over MIDI as a system exclusive data dump. If no receiving device responds the 250 will hang. Use a soft reset (4, 5, SELECT) to bring the 250 back to life.

### KEYPAD BINS (DMP 7)

Pressing the SELECT button when this item is in the display sends the contents of the 250's Keypad Bins out over MIDI as a system exclusive data dump. If no receiving device responds the 250 will hang. Use a soft reset (4, 5, SELECT) to bring the 250 back to life.

### CARTRIDGE DATA (DMP 8)

Pressing the SELECT button when this item is in the display sends the contents of the 250's data cartridge out over MIDI as a system exclusive data dump. If no receiving device responds the 250 will hang. Use a soft reset (4, 5, SELECT) to bring the 250 back to life.

## SET SYSX ID (SYSX 2)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you to enter the MIDI system exclusive ID number for your 250. This is the device ID number; Kurzweil's system exclusive manufacturer's ID number is 7 or $07 (hexadecimal). You can use the VALUE slider to enter a number from 1 through 127. If you are sending and receiving sysex messages between several 250's each one can be given its own unique ID number.

## ECHO DISPLAY TO MIDI (SYSX 3)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you to set the echo display status. You can use the left and right arrow keys to toggle between ON or OFF. If this option is ON, the contents of the display will be sent out over MIDI as sysex data. As yet there are only a few applications for this feature, for example, it may be possible to assist blind users in the operation of the 250 by sending the contents of the display to a computer which could interpret the data and turn it into spoken English. You could also use this feature to bring your RMX's (or K250s) display into the display on a K1000 keyboard.

# The Keyboard Editor

# 5

Chapter Five

# *The Keyboard Editor*

## *Overview*

### DESCRIPTION

The Keyboard Editor allows you to create and modify 250 Keyboards. A Keyboard is a collection of soundfiles and their Instrument voicings arranged in regions and layers. A region is an area on the physical 250 keyboard, a group of keys as small as single note or as large as the entire keyboard. A layer is one entire 88-note stretch of the keyboard and all the regions (splits) assigned to it. A single layer can have up to 88 regions, a single Keyboard can have up to 6 layers.

The process of editing or creating a Keyboard begins by selecting the Keyboard you want to work with. There are two kinds of Keyboards to choose from, user Keyboards and ROM Keyboards. ROM Keyboards are the ones that come with the 250 right from the factory. User Keyboards are the ones you create yourself. ROM Keyboards can never be erased or altered. If, when you begin to work in the Keyboard Edtior, you choose a ROM Keyboard to work with, a copy of that Keyboard will be made and this copy will become part of your user Keyboard. When editing old Keyboards you'll select them from the 250's Keyboard library. When creating a new Keyboard, select an existing Keyboard that most closely resembles the one you want to create. The Keyboard you select is copied in the Keyboard Edit Buffer. It will remain there until you select a new Keyboard or save the current one to the Keyboard Library.

The Keyboard you select when you enter the Keyboard Editor be-

comes the current Keyboard. All editing is done to the current Keyboard. When you select editing commands that affect the regions and layers of a Keyboard, these commands apply only to the current region and the current layer of the current Keyboard. This idea of the current object comes up in all of the 250 editors. When working in the 250 editors try to be aware of the current Keyboard, the current sequence, or the current Instrument. In all cases, if the current item you are working on is not the item you want to edit, there are commands in each editor to change it.

Keyboards can be split (one sound in one region, a different sound in a different region), layered (more than one sound assigned in different layers to a single key), or any combination of the two. Layers and regions can be transposed, made louder or softer, assigned to individual outputs, and given independent dynamic response.

You will find that the Keyboard Editor is an extremely flexible environment that lends itself particularly well to the creation of special live performance Keyboards with literally dozens of sounds assigned to any range.

*Main Menus*

## ASSIGN OPTIONS (KBD 1)

The menu choices under ASSIGN OPTIONS (KBD 1) perform the basic operations of selecting Keyboards and Instruments for editing (KBD 7 and KBD 8).

## INSTRUMENT OPTIONS (KBD 2)

The menu choices under INSTRUMENT OPTIONS (KBD 2) perform operations that apply to a particular Instrument such as substituting Instrument voicings (KBD 9), displaying Instrument voicings (KBD 10), and selecting an Instrument to edit (KBD11).

## TRANSPOSE OPTIONS (KBD 3)

The menu choices under TRANSPOSE OPTIONS (KBD 3) perform operations such as transposing a region (KBD 12), pitch shifting a region (KBD 13), and restoring the original pitch to a region (KBD 14).

### REGION/LAYER OPTIONS (KBD 4)

The menu choices under REGION/LAYER OPTIONS (KBD 4) perform operations such as setting the current region or current layer (KBD 15 and KBD 16) and erasing the current region or current layer (KBD 17 and KBD 18).

### MISC. OPTIONS (KBD 5)

The menu choices under MISC. OPTIONS (KBD 5) perform operations such as setting layer dynamics and volume (KBD 20 and 21), setting the outputs for a region (KBD 22), and comparing an edited Keyboard to the original Keyboard (KBD 19).

### LIBRARY OPTIONS (KBD 6)

The menu choices under LIBRARY OPTIONS (KBD 6) perform the usual object management operations common to several of the 250 editors. There are options for saving Keyboards (KBD 23), renaming Keyboards (KBD 26), erasing Keyboards (KBD 24 and KBD 25), shuffling the Keyboard list (KBD 27), and displaying Keyboard free space.



### ASSIGN OPTIONS (KBD 1)

Pressing the SELECT button when this item is in the display takes the user to ASSIGN KEYBOARD (KBD 7).

### INSTRUMENT OPTIONS (KBD 2)

Pressing the SELECT button when this item is in the display takes the user to SUBSTITUTE INSTRUMENT VOICINGS (KBD 9).

### TRANSPOSE OPTIONS (KBD 3)

Pressing the SELECT button when this item is in the display takes the user to TRANSPOSE REGION (KBD 12).

## REGION/LAYER OPTIONS (KBD 4)

Pressing the SELECT button when this item is in the display takes the user to SET CURRENT REGION (KBD 15).

## MISC. OPTIONS (KBD 5)

Pressing the SELECT button when this item is in the display takes the user to COMPARE TO ORIGINAL KEYBOARD (KBD 19).

## LIBRARY OPTIONS (KBD 6)

Pressing the SELECT button when this item is in the display takes the user to SAVE KBD (KBD 23).

## ASSIGN KEYBOARD (KBD 7)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of the Keyboard you want to assign. You can use the arrow keys to scroll through the list of available Keyboards or you can type the number directly from the numeric keypad. If you use the keypad, remember that you have to press the SELECT button twice in a row to assign the Keyboard.

The 250 will then prompt you to strike the low and high keys of the Keyboard. This will assign it to a range in the current Keyboard. You will then be asked whether you want this new Keyboard split or layered. If you want to split the Keyboard press the YES button. If you want to layer the Keyboard press the NO button.

*For a tutorial on splitting and layering see the appropriate chapter in Volume One.*

If the Keyboard you are editing is a multi-layered Keyboard Setup the 250 will start you at the highest-numbered layer. You can use KBD 16 to change the current layer. If the Keyboard you are editing is a ROM-based Keyboard Setup you will automatically be working with a copy. When you finish editing the copy and go to save it you will need to enter a new number so that it can be saved with the other user Keyboards.

## ASSIGN INSTRUMENT (KBD 8)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of the Instrument you want to assign. You can use the arrow keys to scroll through the list of available Instruments or you can type the number directly from the numeric keypad. If you use the keypad, remember that you have to press the SELECT button twice in a row to assign the Instrument.

The 250 will then prompt you to strike the low and high keys of the Instrument. This assigns it to the current Keyboard. You will then be asked whether you want the Keyboard split or layered. If you want to split the Keyboard press the YES button. If you want to layer the Keyboard press the NO button.

Be careful when you strike the high and low keys to assign an Instrument to a Keyboard. Not all Instruments use Soundfiles which cover the entire 88-note Keyboard. When assigning an Instrument to a region, the 250 matches the highest note of that Instrument with the key you select as the high key for the region. If the high key you select does not match the original high key of the Instrument you probably won't get the results you intend. For example, if you have an Instrument with a range of E0 through E6, and you assign it to the keys E0 through E1, you will hear only E5 through E6 when you play. The high pitch (E6) is set to sound when the specified high key is pressed. To place Instruments in their appropriate ranges just make sure the high key you select matches the high key on the Source Keyboard that the Instrument is based on.

You will also find that when you assign Instruments to regions, as opposed to Keyboards, the sample playback rate of the Instrument changes with the pitch. This can produce extremely interesting effects if you assign the Instrument over a large region, but it may not be what you expected.

## SUBSTITUTE INSTRUMENT VOICINGS (KBD 9)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of the Instrument to be substituted. You can use the arrow keys to scroll through the list of available Instruments or you can type the number directly from the numeric

keypad.

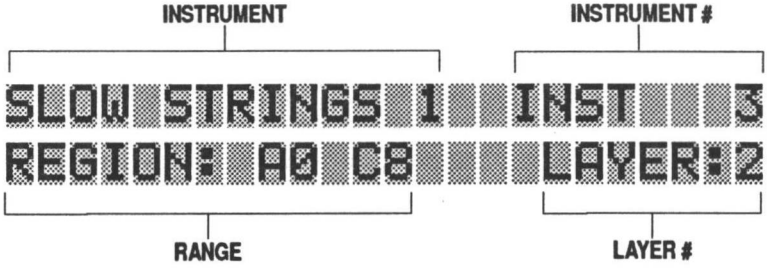
You will then be asked whether you want to substitute the Instrument you have selected into the current Keyboard region. If you want to substitute the Instrument you have selected into the current Keyboard press the YES button. If you do not want to substitute the Instrument you have selected into the current Keyboard region press the NO button.

*This is one of the most powerful features of the Keyboard Editor. It is also one of the easiest to use.*

The ability to substitute Instruments is one of the most powerful features of the Keyboard Editor. An Instrument is really just a collection of effects settings (chorus, tremolo, vibrato, etc...) that can be used to modify digital Soundfile data. SUBSTITUTE INSTRUMENT VOICINGS allows you to process any Soundfile (the one assigned to the current Keyboard) with another Instrument's effect settings (the one you are substituting in). When you substitute an Instrument voicing you replace the Instrument voicing parameters, modifying the existing Soundfile with the parameters of the new Instrument. This can be used to great effect. For example, you can "process" a flute with the trumpet's voicing parameters to get a flute that behaves something like a brass instrument. Or, try processing the Grand Piano with the Instrument from the Slow Strings to get a bowed piano sound.

## SHOW INST VOICINGS (KBD 10)

Pressing the SELECT button when this item is in the display allows you to view the arrangement of Instruments in the current layer of the current Keyboard. The 250 will display the message **SHOW INSTRUMENTS ON KBD: (USE CURSORS TO VIEW)**. Pressing any of the arrow keys will display information about the layer you are currently working on.



To view other layers use the up and down arrow keys. This also sets the current layer as in KBD 16.

## EDIT INSTRUMENT (KBD 11)

Pressing the SELECT button when this item is in the display allows you to edit any Instrument in the current Keyboard. The 250 will display the message **SHOW INSTRUMENTS ON KBD: (USE CURSORS TO VIEW)**. Pressing any of the arrow keys will display information about the current layer you are working on. Use the up and down arrow keys to move through the layers. When you find the Instrument you want to edit, press the SELECT button and you will be taken immediately into the Instrument Editor to VOICING OPTIONS (INST 1).

NOTE: This is the most useful method for entering the Instrument Editor because it will enable you to hear the changes to your Instrument as you make them.

## TRANSPOSE REGION (KBD 12)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of semitones you want to transpose the current layer. Use the arrow keys to set the transposition amount. Pressing the RIGHT ARROW button increments the transposition amount by 1 semitone. Pressing the LEFT ARROW button decrements the transposition amount by 1 semitone. Pressing the UP ARROW button increments the transposition amount by 1 octave (12 semitones). Pressing the DOWN ARROW button decrements the transposition amount by 1 octave (12 semitones).

## PITCH SHIFT REGION (KBD 13)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of semitones you want to pitch shift the current region. Use the arrow keys to set the pitch shift amount. Pressing the RIGHT ARROW button increments the pitch shift amount by 1 semitone. Pressing the LEFT ARROW button decrements the pitch shift amount by 1 semitone. Pressing the UP ARROW button increments the pitch shift amount by 1 octave (12 semitones). Pressing the

DOWN ARROW button decrements the pitch shift amount by 1 octave (12 semitones).

Although this option functions identically to TRANSPOSE REGION (KBD 14) the result it produces is vastly different. Whereas transposition simply raises or lowers the pitch of the region in question, pitch shifting does not. Try to think of pitch shifiting as transpoing a Keyboard's timbre instead of its pitch. As you move upward through the natural range of an acoustic instrument the timbre becomes brighter. Take a violin note on middle C, for instance. Transposing that note up seven semitones to G adjusts its relative position on the physical keyboard—play the G and you'll hear a C, play middle C and you'll hear an F. But if that C is pitch shifted up a fifth to G, playing middle C will still sound a C but that C will have the timbral quality of the G a fifth above. In general, pitch shifting up has the effect of brightening the sound. Pitch shifting down darkens the sound.

## RESTORE PITCH TO REGION (KBD 14)

Pressing the SELECT button when this item is in the display restores the current region to its original pitch (no transposition). The restoration happens automatically when you press the SELECT button. There is no acknowledgement that the operation has taken place. To verify that, in fact, the pitch of the current region has been restored press the LEFT ARROW button and then press the SELECT button. The 250 will display the message: **0 SEMITONES TRANSPOSE**.

## SET CURRENT REGION (KBD 15)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you to strike the low key and the high key for the current region. Striking any two keys on the 250 Keyboard defines the current region.

## SET CURRENT LAYER (KBD 16)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of the layer you would like to become the current layer. You can use the keypad to enter the layer

number. Pressing SELECT sets the current layer. You cannot use the arrow keys to scroll through the available layers.

### ERASE CURRENT REGION (KBD 17)

Pressing the SELECT button when this item is in the display causes the 250 to ask you whether you want to erase the current region. If you want to erase the current region press the YES button. If you do not want to erase the current region press the NO button.

### ERASE CURRENT LAYER (KBD 18)

Pressing the SELECT button when this item is in the display causes the 250 to ask you if you want to erase the current layer. If you want to erase the current layer press the YES button. If you do not want to erase the current layer press the NO button.

### COMPARE TO ORIGINAL KBD (KBD 19)

Pressing the SELECT button when this item is in the display causes the 250 to display the original Keyboard name and number and allows you to compare the sound of the original Keyboard with its newly-edited version. This option is provided to facilitate quick and easy A-B comparisons between the original Keyboard and the edited version. Press the SELECT button repeatedly to toggle back and forth.

### SET LAYER DYNAMICS (KBD 20)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you to enter a value for the dynamic response of the current layer. You can use the VALUE slider to enter a number from 0 to 10 or you can type the number directly from the numeric keypad. Pressing the SELECT button sets the layer dynamics. If you use the numeric keypad, remember that you have to press the SELECT button twice in a row to set the value.

The value set here determines a layer's sensitivity to attack velocity. A value of 10 means the layer has no sensitivity to velocity. Harder key

strikes will not make the current layer any louder. A value of 0 means the current layer has the highest degree of velocity sensitivity. The harder you strike a key, the louder the sound will become.

## SET LAYER VOLUME (KBD 21)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the value of the layer volume adjust. You can use the VALUE slider to enter a number from -128 through 127. Pressing the SELECT button sets the layer volume adjust. If you use the numeric keypad, remember that you have to press the SELECT button twice in a row to set the value.

This option is used for balancing sounds on different layers. In layered Keyboard Setups it is frequently used to adjust the balance of one layer relative to other layers to acheive the best result. Positive numbers increase the volume of a layer. Negative numbers decrease the volume.

## SET OUTPUTS FOR REGION (KBD 22)

*This is a powerful feature. See the section on monophonic outputs in the chapter on the Function Editor for more information.*

Pressing the SELECT button when this item is in the display causes the 250 to prompt you to select the output channel or channels for the current region. Use the twelve buttons on the lower right of the 250 front panel to enable or disable any of the 12 output channels. These buttons will light up when this option is entered. When a channel is enabled its button will be lit. When a channel is disabled its button will not be lit. Make sure you know which region is current before you make changes with complicated Keyboards. You may want to write down the output assignments of the various regions.

## SAVE KBD (KBD 23)

Pressing the SELECT button when this item is in the display allows you to save the current Keyboard to the 250's Keyboard memory. Before saving, the 250 will display the number of the current Keyboard and give you a chance to change it if you want. You must use the numeric keypad to change the number of your Keyboard. Once the number is assigned (press the SELECT button if you've changed the number)

pressing the SELECT button saves the current Keyboard and empties the Keyboard edit buffer. To edit the Keyboard you have just saved (or any other Keyboard) you must select it again from the Keyboard memory with ASSIGN KEYBOARD (KBD7). If you are working on a new Keyboard the 250 will prompt you for a name. If you are working on an existing Keyboard the 250 will ask you if you want to replace the old one.

### ERASE KBD (KBD 24)

Pressing the SELECT button when this item is in the display allows you to erase the current Keyboard. The 250 will ask you if you want to erase the current Keyboard. Pressing the YES button will erase the current Keyboard. Pressing the NO button will abort the operation.

### ERASE ALL KBDS (KBD 25)

Pressing the SELECT button when this item is in the display allows you to erase all Keyboards from memory. When you choose this option you'll be asked: **DO YOU REALLY WANT TO ERASE ALL KEYBOARDS???** Pressing the YES button will erase all Keyboards from the Keyboard memory. Pressing the NO button will abort the operation. Only user Keyboards can be erased from memory.

### RENAME KBD (KBD 26)

Pressing the SELECT button when this item is in the display allows you to rename the current Keyboard. The 250 will prompt you to enter the number of the Keyboard you wish to rename. When you've entered the number and pressed the SELECT button you can give your Keyboard a new name by using the ALPHA slider to scroll through the list of available characters and then hitting the ALPHA button to confirm the current character and move to the next character in the name. If you make a mistake hit the red "R" button to back up one character.

### SHUFFLE KBD LIST (KBD 27)

Pressing the SELECT button when this item is in the display allows you

to shuffle or swap the Keyboards in the 250 Keyboard memory. If you have many Keyboards in memory you may want to reorder them. That's what this item does. The 250 lets you move Keyboards in the Keyboard memory by swapping one Keyboard with another. You will first be prompted for the number of the first Keyboard to be swapped. You'll then be prompted for the number of the second Keyboard to be swapped. When you've entered numbers for both Keyboards pressing the SELECT button swaps the two Keyboards in memory by exchanging their Keyboard numbers.

### SHOW KBD FREE SPACE (KBD 28)

Pressing the SELECT button when this item is in the display causes the 250 to display the available free space—the amount of memory left for the creation of new user Keyboards.

## GETTING AROUND WITH THE FRONT PANEL BUTTONS

In several of the editors it is possible to go directly to a particular menu item by pressing the appropriate front panel button. The button assignments for the Keyboard Editor are listed below. Learning the buttons and their assignments in each of the editors can help you to move around more efficiently.

### KEYBOARD EDITOR BUTTON ASSIGNMENTS

| Pressing This Button... | Takes You to This Item |
|---|---|
| ALPHA | RENAME KBD? (KBD 26) |
| CHORUS | SET LAYER VOLUME? (KBD 21) |
| LEVEL | SET LAYER DYNAMICS? (KBD 20) |
| TRANSPOSE UP | PITCH SHIFT REGION? (KBD 13) |
| TRANSPOSE DOWN | TRANSPOSE REGION? (KBD 12) |
| KEYBOARD | ASSIGN KEYBOARD (KBD 7) |
| "R" | RESTORE PITCH TO REGION (KBD 14) |
| INSTRUMENT | ASSIGN INSTRUMENT? (KBD 8) |
| CONTINUE | SET OUTPUTS FOR REGION? (KBD 22) |
| LOOP | COMPARE TO ORIG. KBD? (KBD 19) |

| | |
|---|---|
| TEMPO UP | SHOW INST VOICINGS? (KBD 10) |
| TEMPO DOWN | SUBSTITUTE INST VOICINGS? (KBD 9) |
| EDIT | EDIT INSTRUMENT? (KBD 11) |
| SEARCH | SHOW KBD FREE SPACE? (KBD 28) |
| SAVE | SAVE KBD? (KBD 23) |
| ERASE | ERASE KBD? (KBD 24) |
| SET POINTER | SET CURRENT REGION? (KBD 15) |
| INSERT | SET CURRENT LAYER? (KBD 16) |
| LIST | SHUFFLE KBD LIST? (KBD 27) |
| MIDI | ERASE ALL KBDS? (KBD 25) |
| READ | ERASE CURRENT REGION? (KBD 17) |
| SEND | ERASE CURRENT LAYER? (KBD 18) |

# *The Instrument Editor*

# 6

*Chapter Six*

# *The Instrument Editor*

## *Overview*

### DESCRIPTION

An Instrument is the set of instructions which gives a Soundfile its character when the two are combined to create a Keyboard Setup. The 250 comes with many Soundfiles. You can also create your own through sampling in the 250 digitizer. The Instrument Editor enables you to modify existing Instruments and save them in the Instrument Library or create new Instruments. Once created and modified, these Instruments can be assigned to Keyboards.

The Instrument Editor provides a number of options which allow you to modify the behavior of Soundfiles. A number of special effects can be applied like Vibrato, Chorusing, and Tremolo. The timbre of a Soundfile can be changed through the Brightness options. A Soundfile can also be given an amplitude envelope. Amplitude envelopes can be used to effect volume changes in a sound over time.

The process of editing or creating an Instrument begins by selecting the Instrument you want to work with. There are two kinds of Instruments to choose from, user Instruments and ROM Instruments. ROM Instruments are the ones that come with the 250 right from the factory. User Instruments are the ones you create yourself. ROM Instruments can never be erased or altered. If, when you begin to work in the Instrument Editor, you choose a ROM Instrument to work with, a copy of that Instrument will be made and this copy will become part of your

user Instrument library when you save it. When editing existing user Instruments you'll select them from the 250's Instrument library. When creating a new Instrument, select an existing Instrument that most closely resembles the one you want to create. The Instrument you select is copied into the Instrument Edit Buffer. It will remain there until you select a new Instrument or save the current one to the Instrument Library.

The Instrument you select when you enter the Instrument Editor becomes the current Instrument. All editing applies to the current Instrument. In order for an Instrument to be heard it must be assigned to a 250 Keyboard.

*Main Menus*

## VOICING OPTIONS (INST 1)

The menu choices under VOICING OPTIONS (INST 1) perform operations such as capturing effects settings (INST 9), setting an Instrument's output group (INST 10), setting an Instrument's minimum and maximum attenuation (INST 11 and INST 12), removing or adding touch sensitivity (INST 13), and reversing velocity tracking (INST 14).

## CHORUSING OPTIONS (INST 2)

The menu choices under CHORUSING OPTIONS (INST 2) perform operations such as setting the chorus type (INST 16), setting the chorus detune amount (INST 17), and setting the chorus delay amount (INST 18).

## VIBRATO OPTIONS (INST 3)

The menu choices under VIBRATO OPTIONS (INST 3) perform operations such as setting the vibrato curve type (INST 19), setting vibrato depth, rate, and delay (INST 20, INST 21, and INST 22), and modifying the vibrato delay ramp (INST 23).

## TREMOLO OPTIONS (INST 4)

The menu choices under TREMOLO OPTIONS (INST 4) perform

operations such as setting tremolo curve type (INST 24), setting tremolo depth, rate, and delay (INST 25, INST 26, and INST 27), and modifying the tremolo delay ramp (INST 28).

### ENVELOPE OPTIONS (INST 5)

The menu choices under ENVELOPE OPTIONS (INST 5) perform operations such as creating or modifying Instrument envelopes (INST 29), importing Instrument envelopes (INST 30), and toggling Instrument envelopes (INST 31).

### BRIGHTNESS OPTIONS (INST 6)

The menu choices under BRIGHTNESS OPTIONS (INST 6) perform operations such as setting the brightness level and threshold (INST 32 and INST 33), setting the brightness dynamic range (INST 34), and turning aliasing on or off (INST 35).

### MISC. EFFECTS (INST 7)

The menu choices under MISC. EFFECTS (INST 7) perform various operations such as setting the effects flags (INST 36), setting all parameters to their default values (INST 37), comparing the edited Instrument with the original Instrument (INST 38), setting the sustain decay rate (INST 39), putting an Instrument into monophonic or polyphonic mode (INST 40), making an Instrument ignore key releases (INST 41), and setting the Source Keyboard (INST 42).

### LIBRARY OPTIONS (INST 8)

The menu choices under LIBRARY OPTIONS (INST 8) perform the usual object management operations common to several of the 250 editors. There are options for saving Instruments (INST 43), erasing Instruments (INST 44 and INST 45), renaming Instruments (INST 46), shuffling the Instrument list (INST 47), and displaying the available Instrument free space (INST 48).

*Reference Guide*

### VOICING OPTIONS (INST 1)

Pressing the SELECT button when this item is in the display takes the user to CAPTURE EFFECT SETTINGS (INST 9).

### CHORUSING OPTIONS (INST 2)

Pressing the SELECT button when this item is in the display takes the user to SET CHORUS TYPE (INST 16).

### VIBRATO OPTIONS (INST 3)

Pressing the SELECT button when this item is in the display takes the user to SET VIBRATO CURVE TYPE (INST 19).

### TREMOLO OPTIONS (INST 4)

Pressing the SELECT button when this item is in the display takes the user to SET TREMOLO CURVE TYPE (INST 24).

### ENVELOPE OPTIONS (INST 5)

Pressing the SELECT button when this item is in the display takes the user to CREATE/MODIFY ENVELOPE (INST 29).

### BRIGHTNESS OPTIONS (INST 6)

Pressing the SELECT button when this item is in the display takes the user to SET BRIGHTNESS LEVEL (INST 32).

### MISC. EFFECTS (INST 7)

Pressing the SELECT button when this item is in the display takes the user to SET EFFECTS FLAGS (INST 36).

### LIBRARY OPTIONS (INST 8)

Pressing the SELECT button when this item is in the display takes the user to SAVE INST (INST 43).

### CAPTURE EFFECT SETTINGS (INST 9)

Pressing the SELECT button when this item is in the display captures the settings of all of the 250's assignable controllers and assigns them to the Instrument you are editing. The 250 will respond with the message: **EFFECTS COPIED**. When the settings of the assignable controllers are captured they immediately become part of the Instrument voicing.

### SET OUTPUT GROUP (INST 10)

Pressing the SELECT button when this item is in the display allows the user to assign the current Instrument to one of the main stereo outputs. An Instrument can be assigned to output 0 (Instrument Group A, the left channel) or output 1 (Instrument Group B, the right channel). Where an Instrument actually ends up in the stereo field is determined by the position of the two front panel sliders for INSTRUMENT GROUP A and INSTRUMENT GROUP B.

### SET MIN ATTENUATION (INST 11)

Pressing the SELECT button when this item is in the display allows the user to set the minimum attenuation for the current Instrument. Use the value slider to enter a number from 0 to 255. Remember, you are setting attenuation here (attenuation means a *reduction* in volume) so setting the minimum attenuation means that you are setting the maximum volume level for the current Instrument.

### SET MAX ATTENUATION (INST 12)

Pressing the SELECT button when this item is in the display allows the user to set the maximum attenuation for the current Instrument. Use the VALUE slider to enter a number from 0 to 255. Remember, you are

setting attenuation here (attenuation means a *reduction* in volume) so setting the maximum attenuation means that you are setting the minimum volume level for the current Instrument.

## REMOVE/ADD TOUCH SENSE (INST 13)

Pressing the SELECT button when this item is in the display allows the user to toggle between enabling and disabling touch sensitivity for the current Instrument. When you choose this option the display does not change. Normally, touch sensitivity is enabled. So, the first time you press the SELECT button you probably will be removing an Instrument's touch sensitivity. Removing touch sensitivity is the same as setting both the minimum and maximum attenuation to 0. The easiest way to tell if touch sensitivity has been disabled is to play the Instrument from the keyboard. If you are still unsure, check the values for minimum and maximum attenuation. If both minimum and maximum attenuation are set to 0 then the Instrument has no touch sensitivity. Selecting INST 13 again will restore the minimum and maximum attenuation values only if they were not set to 0 to begin with.

## SET VELOCITY TRACKING (INST 14)

Pressing the SELECT button when this item is in the display allows the user to set the current Instrument to antitrack velocity or reverse velocity response. The 250 will prompt you with this message: **SET INST TO ANTITRACK VELOCITY?** If you want to set the Instrument to antitrack velocity press the YES button. If you do not want to set the Instrument to antitrack velocity press the NO button.

Antitrack velocity is another way of saying reverse velocity. Normally, when you play harder the sound you get is louder and brighter. When reverse velocity is in effect the sound gets louder and brighter the *softer* you play. In other words, setting an Instrument to antitrack velocity inverts its velocity response.

## CHANGE CURRENT KEYBOARD (INST 15)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of the Keyboard you wish to select.

You can use the arrow keys to scroll through the list of available Keyboards or you can enter the number from the numeric keypad. Pressing the SELECT button sets the new Keyboard. Remember, if you use the numeric keypad you have to press the SELECT button twice in a row to perform the action.

If the Instrument you are editing was not part of the current Keyboard when you entered the Instrument Editor you won't be able to hear any of the changes you make. You could exit the Instrument Editor back to Play Mode, select the appropriate Keyboard, and return to the Instrument Editor but using CHANGE CURRENT KEYBOARD (INST 15) is easier because it lets you accomplish this without leaving. If, at this point, you choose a Keyboard that doesn't use the current Instrument you are editing you still won't be able to hear the changes. See the list of Factory Instruments in the Appendices of Volume One.

## SET CHORUS TYPE (INST 16)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of the chorus type you wish to select. You can use the arrow keys to scroll through the list of chorus types. The available chorus types are:

*These options are identical to the ones discussed in the Chorus Editor section of the chapter on the Play Editors.*

| | |
|---|---|
| NO CHORUS | 0 |
| DOUBLING | 1 |
| FULL CHORUS | 2 |
| FLANGING | 3 |
| ECHO | 4 |
| MICROTONAL | 5 |

Pressing the SELECT button sets the chorus type. For a complete discussion of the five chorus types see the section on the Chorus Editor in Chapter 3, *The Play Editors*.

## SET CHORUS DETUNE (INST 17)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the value of the chorus detune. You can use the VALUE slider to enter the detune amount. Negative detune amounts can be used with all chorus types except ECHO where the detune

amount sets the volume of the echo, not a change in pitch. For a complete discussion of chorus detune see the section on the Chorus Editor in Chapter 3, *The Play Editors*.

## SET CHORUS DELAY (INST 18)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the chorus delay amount. You can use the VALUE slider or enter a number with the numeric keypad to enter the delay amount. For a complete discussion of chorus delay see the section on the Chorus Editor in Chapter 3, *The Play Editors*.

## SET VIBRATO CURVE TYPE (INST 19)

Pressing the SELECT button when this item is in the display allows you to set the vibrato curve type for the current Instrument. Use the arrow keys to scroll through the list of curve types. The available curve types are:

| | |
|---|---|
| NO LFO | 0 |
| TRIANGLE +/- | 1 |
| SQUARE +/- | 2 |
| ASCENDING RAMP +/- | 3 |
| DESCENDING RAMP +/- | 4 |
| TRIANGLE + | 5 |
| SQUARE + | 6 |
| ASCENDING RAMP + | 7 |
| DESCENDING RAMP + | 8 |
| TRIANGLE - | 9 |
| SQUARE - | 10 |
| ASCENDING RAMP - | 11 |
| DESCENDING RAMP - | 12 |

Pressing the SELECT button sets the vibrato curve type. For a complete discussion of vibrato curve types see the section on Vibrato in the chapter on the Function Editor.

## SET VIBRATO DEPTH (INST 20)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the vibrato depth amount. Use the VALUE slider or the numeric keypad to enter the number. For a complete discussion of vibrato depth see the section on Vibrato in chapter on the Function Editor.

## SET VIBRATO RATE (INST 21)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the vibrato rate amount. Use the VALUE slider or the numeric keypad to enter the number. For a complete discussion of vibrato rate see the section on Vibrato in the chapter on the Function Editor.

*Remember, if you enter a value from the numeric keypad you must press the SELECT button twice in a row.*

## SET VIBRATO DELAY (INST 22)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the vibrato delay amount. Use the VALUE slider or the numeric keypad to enter the number. For a complete discussion of vibrato delay see the section on Vibrato in the chapter on the Function Editor.

## MODIFY VIB DELAY RAMP (INST 23)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the value of the vibrato delay ramp slope. Use the VALUE slider or the numeric keypad to enter the number. This parameter affects the length of time (the delay) before the vibrato effect reaches its full depth. Larger values produce longer delays.

## SET TREMOLO CURVE TYPE (INST 24)

Pressing the SELECT button when this item is in the display allows you to set the tremolo curve type for the current Instrument. Use the arrow keys to scroll through the list of curve types. The available curve types are:

| | |
|---|---|
| NO LFO | 0 |
| TRIANGLE +/- | 1 |
| SQUARE +/- | 2 |
| ASCENDING RAMP +/- | 3 |
| DESCENDING RAMP +/- | 4 |
| TRIANGLE + | 5 |
| SQUARE + | 6 |
| ASCENDING RAMP + | 7 |
| DESCENDING RAMP + | 8 |
| TRIANGLE - | 9 |
| SQUARE - | 10 |
| ASCENDING RAMP - | 11 |
| DESCENDING RAMP - | 12 |

Pressing the SELECT button sets the tremolo curve type. For a complete discussion of tremolo curve types see the section on Tremolo in the chapter on the Function Editor.

## SET TREMOLO DEPTH (INST 25)

Pressing the SELECT button when this item is in the display allows you to set the tremolo depth amount for the current Instrument. Use the VALUE slider or the numeric keypad to enter the tremolo depth amount. For a complete discussion of tremolo depth see the section on Tremolo in the chapter on the Function Editor.

## SET TREMOLO RATE (INST 26)

Pressing the SELECT button when this item is in the display allows you to set the tremolo rate amount for the current Instrument. Use the VALUE slider or the numeric keypad to enter the tremolo rate amount. For a complete discussion of tremolo rate see the section on Tremolo in the chapter on the Function Editor.

## SET TREMOLO DELAY (INST 27)

Pressing the SELECT button when this item is in the display allows you to set the tremolo delay amount for the current Instrument. Use the

VALUE slider or the numeric keypad to enter the tremolo delay amount. For a complete discussion of tremolo delay see the section on Tremolo in the chapter on the Function Editor.

### MODIFY TREM DELAY RAMP (INST 28)

Pressing the SELECT button when this item is in the display allows you to set the tremolo delay ramp slope for the current Instrument. Use the VALUE slider or the numeric keypad to enter the tremolo delay ramp slope. This parameter affects the length of time (the delay) before the tremolo effect reaches its full depth. Larger values produce longer delays.

*The Envelope Editor*

### CREATE/MODIFY ENVELOPE (INST 29)

Pressing the SELECT button when this item is in the display allows you to modify the amplitude envelope of the current Instrument. If the current Instrument does not already have an envelope the 250 will create a standard three-segment envelope for you. If the current Instrument has an envelope the 250 will allow you to view and edit its parameters.

Envelopes are made up of envelope segments (up to 256 of them) and those segments come in four types. Use the left and right arrow keys to scroll through an envelope's segments. Use the up and down arrow keys to scroll through the four segment types. Press the SELECT button to change the segment type. The available segment types are:

Exponential Growth
Logarithmic Attack
Delay Segment
Exponential Decay

In an Exponential Growth segment the volume level increases at a constant rate. In a Lograrithmic Attack segment, the volume level increases continuously but the rate of increase increases as the segment nears its loudest point. In a Delay segment the volume level is constant. In an Exponential Decay segment the volume level decreases at a constant rate.

channels to Keyboard Setups (MIDI 11).

### TRANSMIT OPTIONS (MIDI 2)

The menu choices under TRANSMIT OPTIONS (MIDI 2) perform operations such as setting the 250's MIDI transmit mode (MIDI 12), setting the number of slave devices being used (MIDI 13), setting the MIDI controller transmission assignments for front panel controls (MIDI 14), enabling the transmission of MIDI program changes (MIDI 15), and transmitting Local Control Off (MIDI 16).

### BASIC CHANNEL (MIDI 3)

This menu choice is used to set the 250's basic MIDI channel.

### REVERSE VELOCITY (MIDI 4)

This menu choice is used to set the 250 into reverse velocity mode for incoming MIDI data.

### FACTORY DEFAULTS (MIDI 5)

This menu choice is used to reset the 250's MIDI options to their default settings.

*Reference Guide*

### RECEIVE OPTIONS (MIDI 1)

Pressing the SELECT button when this item is in the display takes you to RECEIVE MODE (MIDI 6).

### TRANSMIT OPTIONS (MIDI 2)

Pressing the SELECT button when this item is in the display takes you to TRANSMIT MODE (MIDI 12).

## BASIC CHANNEL (MIDI 3)

Pressing the SELECT button when this item is in the display allows you to set the 250's basic channel. Use the VALUE slider or the numeric keypad to assign the 250 to any of the sixteen MIDI channels.

The basic channel is the MIDI channel that the 250 will normally use when sending or receiving MIDI data. The 250 will always be communicating over MIDI on the basic channel unless you are working on a sequencer track that has been set to use some other MIDI channel. In that case, the 250 will be communicating over that particular track's assigned MIDI channel.

NOTE: The basic channel is the MIDI channel the 250 RMX uses to receive its controller information from other MIDI devices.

## REVERSE VELOCITY (MIDI 4)

Pressing the SELECT button when this item is in the display allows you to put the 250 into reverse velocity mode. Reverse velocity can be ON or OFF. Use the left and right arrow keys to toggle between the two choices. Selecting ON enables reverse velocity, selecting OFF disables reverse velocity.

The 250 is a velocity-sensitive instrument, with the ability to detect and respond to key strikes of varying intensity. Normally, harder strikes produce louder, brighter sounds. But when reverse velocity is ON, harder strikes producer softer, duller sounds, while softer strikes produce louder, brighter sounds. This is equivalent to anti-tracking velocity in the Instrument Editor, but this pertains only to velocity information received via MIDI.

## FACTORY DEFAULTS (MIDI 5)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you with the question: **RESET TO FACTORY?** Pressing the YES button will reset the 250's MIDI options to their factory default settings: OMNI Mode will be on, the 250's basic channel will be Channel 1, and all control assignments will be returned to their original settings.

## RECEIVE MODE (MIDI 6)

Pressing the SELECT button when this item is in the display allows you to set the 250's MIDI receive mode. There are three choices. Use the left and right arrow keys to scroll through the list, then press the SELECT button to confirm your choice.

*If you are doing any work with an external sequencer you will want to put the 250 in Multi Mode.*

| | |
|---|---|
| OMNI ON | 1 |
| OMNI OFF | 2 |
| MULTI | 3 |

In OMNI ON mode, the 250 will receive MIDI data over any MIDI channel, and will use the current active Keyboard Setup.

In OMNI OFF mode, the 250 will send and receive MIDI data only on the basic channel. The current Keyboard Setup will be used.

In MULTI MODE, the 250 can receive MIDI data on any MIDI channel. You can enable and disable each channel independently, and select a Keyboard for each channel independently. This is extremely powerful for use with external sequencing programs. See MIDI 11 for further information.

## RECEIVE CONTROLS (MIDI 7)

RMX

Pressing the SELECT button when this item is in the display allows you to set the receive assignments for any of the 250's Assignable Controls on the front panel (including those for the RMX which do not have physical counterparts). There are 11 different Assignable Controls. Use the left and right arrow keys to scroll through the list. When you've found the control you want to edit press the SELECT button. Then, use the VALUE slider or the numeric keypad to enter the new assignment. Here is the list of Assignable Controls:

SLIDER 1
SLIDER 2
SLIDER 3
LEFT LEVER
RIGHT LEVER

LEFT PEDAL
RIGHT PEDAL
EXTERNAL 1
EXTERNAL 2
PANEL BUTTONS
MASTER TUNE

A value of 0 for any control means that that control has no assignment.

Be careful not to confuse these with the Function assignments we described in the chapter on the Function Editor. These assignments apply to incoming MIDI control messages only. They are used to match the MIDI destination number of the sending device with 250's MIDI assignment. For example, if you wanted to use the breath controller on your DX-7 to bend pitch on the 250, you might assign the Left Lever Function to Pitch Bend, and assign the Left Lever MIDI to 2, the MIDI controller number for breath control.

## RECEIVE PROGRAM CHANGE (MIDI 8)

Pressing the SELECT button when this item is in the display allows you to enable the 250 to receive and respond to MIDI program changes. There are three choices. Use the left and right arrow keys to scroll through the list. The choices are:

| | |
|---|---|
| OFF | 0 |
| SETUP NUMBERS | 1 |
| LIST ENTRIES | 2 |

Selecting OFF disables the reception of MIDI program changes. Any program changes sent to the 250 over MIDI will be ignored.

Selecting SETUP NUMBERS enables the 250 to respond to MIDI program changes. In this mode, MIDI program changes will call up the corresponding 250 Keyboard setup. For example, program change #1 will call up the 250 Grand Piano, #2 will call up the Acoustic Bass/ Grand Piano split Keyboard.

*If you need to call up Keyboards with numbers higher than 127 use the Keyboard Setup list.*

Selecting LIST ENTRIES also enables the 250 to respond to MIDI program changes. In this mode, MIDI program changes will call up Keyboard Setups according to their assigned List Entry Numbers.

Program change #1 will call up the Keyboard with List Entry Number #1, and so on. This allows you to map Keyboards to any program change number you want, and to access 250 Keyboards over MIDI with numbers higher than 127, the highest allowable MIDI program change number.

### RECEIVE LOCAL CTL OFF (MIDI 9)

Pressing the SELECT button when this item is in the display allows you to define the way the 250 responds to the MIDI command Local Control Off. Select ON and the 250 will accept a Local Control Off message, disabling the Performance Keyboard. (This obviously does not apply to the RMX which has no Keyboard). Select OFF, and the 250 will ignore any Local Control Off message.

### RECEIVE ALL NOTES OFF (MIDI 10)

Pressing the SELECT button when this item is in the display allows you to define the way the 250 responds to MIDI command All Notes Off. Use the left and right arrow keys to toggle between the two choices. Selecting ON enables the 250 to respond to the MIDI All Notes Off command. If the command is received the 250 will turn off all notes that are playing at the time.

**RMX**

NOTE: This feature is especially important for RMX owners using Keyboard controllers which send periodic All Notes Off messages. If you can't get sustain to work on your RMX, try setting this parameter to Off.

### RECEIVE CHANNELS (MIDI 11)

Pressing the SELECT button when this item is in the display allows you to enable or disable any of the 16 MIDI channels and to assign a 250 Keyboard Setup to any MIDI channel. A MIDI channel can be assigned to the current Keyboard Setup, any other 250 Keyboard Setup, or it can be turned off entirely.

If a MIDI channel is set to CURRENT SETUP, any time the 250 receives MIDI data on that channel the current Keyboard Setup (as shown in

the 250's display) will sound. This enables you to change the sound on any given MIDI channel from the 250's front panel.

If a MIDI channel is assigned to a specific 250 Keyboard number, any time the 250 receives MIDI data on that channel the assigned 250 Keyboard will sound. This allows you to change the Keyboard Setup on the 250's Performance Keyboard without affecting the MIDI channel assignments.

MIDI program changes will be received by active channels at both the Current Setup and specific Setup settings. A channel set to Current Setup will be reset to a specific Setup if it receives a MIDI program change.

If a MIDI channel is off any data received over that channel will be ignored by the 250.

To enable a MIDI channel and assign a Keyboard to it press the SELECT button. Use the left and right arrow keys to scroll through the 16 MIDI channels. Each MIDI channel is initially assigned to play the CURRENT SETUP. To change that assignment, scroll with the arrow keys until the channel you want to assign appears in the display, and press the SELECT button. Now the left and right arrow keys scroll between the three basic assignment options: CURRENT SETUP, OFF, and the 250 KEYBOARDS. To turn a channel off, scroll until you see OFF and press the SELECT button. To assign a channel to a 250 Keyboard scroll until you see KURZWEIL GRAND PIANO. Now you can use the numeric keypad or the up and down arrows to choose the Keyboard you want to assign. Pressing the SELECT button assigns the Keyboard. If you're using the numeric keypad remember to press the SELECT button twice.

## TRANSMIT MODE (MIDI 12)

Pressing the SELECT button when this item is in the display allows you to set the 250's MIDI transmission mode. Use the left and right arrow keys to toggle between the two choices:

| | |
|---|---|
| NORMAL | 1 |
| CYCLE | 2 |

In NORMAL mode all MIDI information will be sent out over the 250's basic MIDI channel.

In CYCLE mode each successive note is sent out on a different MIDI channel. The first note is sent out on the basic channel and each successive note is sent on the next highest MIDI channel, up to the limit set in NUMBER OF SLAVES (MIDI 13).

## NUMBER OF SLAVES (MIDI 13)

Pressing the SELECT button when this item is in the display allows you to tell the 250 how many slave devices it is attached to. This option works in conjunction with CYCLE mode to allow the master 250 to control more voices than the maximum of 12 that the 250 is capable of producing simultaneously. Use the VALUE slider to set the number of slaves that are connected over MIDI. The maximum number of slaves is 16.

## TRANSMIT CONTROLS (MIDI 14)

Pressing the SELECT button when this item is in the display allows you to set the transmission assignments for any of the 250's front panel Assignable Controls. There are 11 different Assignable Controls. Use the left and right arrow keys to scroll through the list. When you've found the control you want to edit press the SELECT button. Then, use the VALUE slider or the numeric keypad to enter the new assignment. Here is the list of Assignable Controls:

SLIDER 1
SLIDER 2
SLIDER 3
LEFT LEVER
RIGHT LEVER
LEFT PEDAL
RIGHT PEDAL
EXTERNAL 1
EXTERNAL 2
PANEL BUTTONS
MASTER TUNE

A value of 0 for any control means that that control has no assignment.

These assignments concern MIDI data only and are not to be confused with similar assignments made in the Function Editor. For a discussion of the distinction between MIDI assignments and Function assignments see RECEIVE CONTROLS (MIDI 7) earlier in this chapter.

## TRANSMIT PROGRAM CHANGE (MIDI 15)

Pressing the SELECT button when this item is in the display allows you to enable the 250 to transmit MIDI program changes. There are three choices. Use the left and right arrow keys to scroll through the list. The choices are:

| | |
|---|---|
| OFF | 0 |
| SETUP NUMBERS | 1 |
| LIST ENTRIES | 2 |

Selecting OFF disables the transmission of MIDI program changes.

Selecting SETUP NUMBERS enables the 250 to transmit MIDI program changes. In this mode, MIDI program changes will be transmitted according to the current Keyboard Setup. For example, selecting Keyboard Setup #1 will transmit program change #1, and so on.

Selecting LIST ENTRIES also enables the 250 to transmit MIDI program changes. In this mode, MIDI program changes will be transmitted according to their assigned List Entry Numbers. Selecting the Keyboard assigned to List Entry #1 will transmit program change #1, and so on.

## TRANSMIT LOCAL CTL OFF (MIDI 16)

Pressing the SELECT button when this item is in the display allows you to enable the transmission of the MIDI message Local Control Off. Transmission is either ON or OFF. Use the left and right arrow keys to toggle between the two options. Enabling the transmission of Local Control Off causes the 250 to transmit the Local Control Off message whenever MIDI is enabled.

# *The 250 Sequencer*

# 8

*Chapter Eight*

# *The 250 Sequencer*

## *Overview*

### THE 250 SEQUENCER

The sequencer in the 250 is a music recording environment similar to a multi-track tape recorder. But unlike a multi-track tape recorder it does not record sound, it only records a musical performance. When you play a note on the Keyboard or depress a pedal, you generate performance events that the 250 can record. It is these events that get recorded and saved in a sequence. When they are played back, the performance is recreated with one or more of the 250's many Keyboards.

The 250 sequencer records on 12 tracks. Each track can have its own Keyboard. In addition to producing sound with the 250, the sequencer can also be used to record performances intended for other MIDI devices. Instead of using a 250 Keyboard to hear the perfomance, the data can be sent over MIDI to another device in your MIDI system.

*The 250's sequencer can be used to sequence external MIDI instruments as well as its own internal sounds.*

When you record a track, the 250 watches for the events you generate, recording how and when they occur. Events are timed in measures, beats, and fractions. The fraction is the smallest possible unit of measurement. For editing purposes there are 256 fractions to a beat, although the 250 records much more precisely.

There are 17 different kinds of events that you can record in a sequence. Some can be recorded right from the 250 while others must be inserted manually into the sequence from within the Sequence Editor. The Sequence Editor is the environment in which you create and

modify your sequences. You do not need to be in the Sequence Editor to record tracks. You can start recording by just pressing the SEQUENCE button to turn the sequencer on.

When you record a new sequence it is recorded into the edit buffer. The most recently recorded track is available for editing. Once you save the sequence it is stored in the 250's sequence library. To edit a sequence you must load it from the sequence library into the Sequence Edit Buffer. Once a sequence is loaded it becomes the current sequence. All editing affects the current sequence. To edit a single track that track must also be loaded before it can become the current track. To edit single events you must set the Edit Pointer to the event you want to change.

The 250 sequencer is very sophisticated. It provides all the features you need to compose and record many pieces. You can record large pieces but there is a limit. The is room for over 12,000 events in the 250 sequence library. When the total number of events in all your sequences reaches that amount, you cannot record anything else until you save your existing sequences somewhere else, or erase some or all of them.

*Main Menus*

## SEQUENCE OPTIONS (SEQ 1)

The menu choices under Sequence Options (SEQ 1) perform basic global operations such as loading a sequence into the edit buffer for editing (SEQ 9), starting and stopping a sequence (SEQ 10), and displaying general information about the current status of a sequence.

## TRACK OPTIONS (SEQ 2)

The menu choices under Track Options (SEQ 2) perform local operations that apply to the current track such as loading a track into the edit buffer (SEQ 12), setting the edit and play pointers (SEQ 13 and SEQ 14), modifying and inserting individual events (SEQ 16 and SEQ 17), erasing events and tracks (SEQ 18 and SEQ 19), punch-in recording (SEQ 22 and SEQ 23), and several other track-specific options.

## LOOP/COPY OPTIONS (SEQ 3)

The menu choices under LOOP/COPY OPTIONS (SEQ 3) perform operations such as recording continuous loops (SEQ 29), chaining sequences together (SEQ 27), and copying sections of music from one track to another (SEQ 30).

## MIX OPTIONS (SEQ 4)

The menu choices under MIX OPTIONS (SEQ 4) perform track mixing operations like adjusting the volume of individual tracks (SEQ 31), muting and soloing tracks (SEQ 32 and SEQ 33), transposing tracks (SEQ 34), and setting a track's default Keyboard.

## RHYTHM OPTIONS (SEQ 5)

The menu choices under RHYTHM OPTIONS (SEQ 5) perform operations such as setting the time signature (SEQ 37), setting the tempo (SEQ 36), and defining quantization parameters (SEQ 39, 40, and 41).

## MIDI OPTIONS (SEQ 6)

The menu choices under MIDI OPTIONS (SEQ 6) perform operations such as assigning each sequence track to its own MIDI channel (SEQ 43), enabling and disabling MDI recording (SEQ 44), and setting each sequence track to the desired playback mode (SEQ 42).

## SYNC OPTIONS (SEQ 7)

The menu choices under SYNC OPTIONS (SEQ 7) perform operations that allow the 250 to synchronize to external devices. There are options for setting up the 250 as a master or slave device (SEQ 46), setting the sync clock rate (SEQ 47), using an external trigger signal to start recording and playback (SEQ 48), and enabling or disabling the built-in metronome (SEQ 51).

*Reference Guide*

## LIBRARY OPTIONS (SEQ 8)

The menu choices under LIBRARY OPTIONS (SEQ 8) perform the usual object management operations common to several of the 250 editors. There are options for saving sequences (SEQ 52), renaming sequences (SEQ 53), and erasing sequences (SEQ 55).

## SEQUENCE OPTIONS (SEQ 1)

Pressing the SELECT button when this item is in the display takes the user to LOAD SEQ TO EDIT (SEQ 9).

## TRACK OPTIONS (SEQ 2)

Pressing the SELECT button when this item is in the display takes the user to LOAD TRACK TO EDIT (SEQ 12).

## LOOP/COPY OPTIONS (SEQ 3)

Pressing the SELECT button when this item is in the display takes the user to RECHAIN SEQUENCE (SEQ 28).

## MIX OPTIONS (SEQ 4)

Pressing the SELECT button when this item is in the display takes the user to VOLUME ADJUST TRACK (SEQ 31).

## RHTYHM OPTIONS (SEQ 5)

Pressing the SELECT button when this item is in the display takes the user to SET TIME SIGNATURE (SEQ 37).

## MIDI OPTIONS (SEQ 6)

Pressing the SELECT button when this item is in the display takes the user to SET TRACK MIDI MODES (SEQ 42).

### SYNC OPTIONS (SEQ 7)

Pressing the SELECT button when this item is in the display takes the user to SEQUENCER SYNC MODE (SEQ 46).

### LIBRARY OPTIONS (SEQ 8)

Pressing the SELECT button when this item is in the display takes the user to SAVE CURRENT SEQUENCE (SEQ 52).

### LOAD SEQ TO EDIT (SEQ 9)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of the sequence you want to load from the 250 sequence library into the edit buffer. You can use the arrow keys to scroll through the list of available sequences or you can type the number directly from the numeric keypad. When you've chosen your sequence, pressing the SELECT button loads it into the edit buffer. Once a sequence is loaded it becomes the current sequence.

If the edit buffer already has a sequence in it when you attempt to load a new sequence you will be asked whether you want to save or erase the current sequence. If you want to save the current sequence before loading a new one press the SAVE button. If you want to erase the current sequence press the ERASE button.

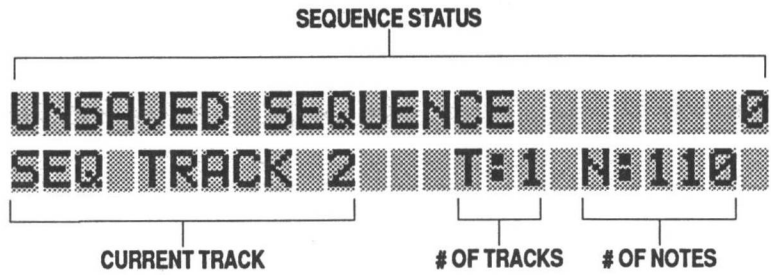
### START/STOP SEQUENCE (SEQ 10)

If the current sequence is playing, pressing the SELECT button when this item is in the display stops sequence playback. Pressing the SELECT button again starts the sequence at the current position of the play pointer. For information on setting the play pointer see SET PLAY POINTER (SEQ 14).

### DISPLAY SEQ STATUS (SEQ 11)

Pressing the SELECT button when this item is in the display causes the

250 to display general information about the current sequence.



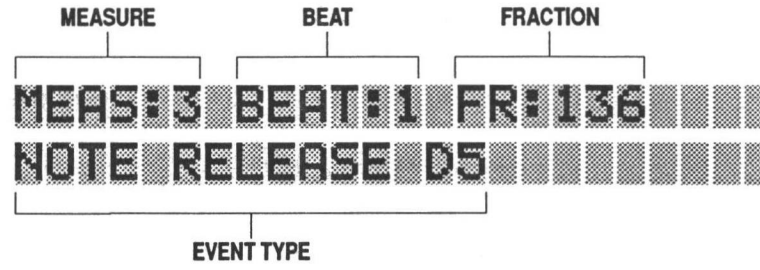

## LOAD TRACK TO EDIT (SEQ 12)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the number of the track you want to load into the edit buffer from the current sequence. You can use the VALUE slider to select a track or you can type the number directly from the numeric keypad. When you've chosen your track, pressing the SELECT button loads it into the edit buffer. Once a track is loaded it becomes the current track. You must load a track before you can begin editing.

## SET EDIT POINTER (SEQ 13)

Pressing the SELECT button when this item is in the display allows you to set the sequencer's edit pointer. You'll be prompted for the measure at which you wish to position the edit pointer. You can use the VALUE slider to enter the measure number or you can type it in directly from the numeric keypad. Pressing the SELECT button sets the edit pointer at the first event in the current track that occurs after the measure number you have selected. This event becomes the current event.

If you had set the edit pointer to measure three, for example, the display might look like this, showing the current event:



Once the edit pointer is set there are a number of different actions you can take.

Pressing the SEARCH button allows you to enter an event type you want the 250 to search for. For more information see SEARCH TRACK (SEQ 15).

Pressing the EDIT button allows you to modify the current event. For more information see MODIFY CURRENT EVENT (SEQ 16).

Pressing the INSERT button allows you to insert an event in front of the current event.

Pressing the ERASE button removes the current event from the track.

Pressing the SET POINTER button allows you to move the edit pointer to another measure.

Pressing the RIGHT ARROW button moves the edit pointer forward in time to the next event.

Pressing the LEFT ARROW button moves the edit pointer backward in time to the previous event.

Pressing the "R" button resets the edit pointer to its original position in the current track.

## SET PLAY POINTER (SEQ 14)

Pressing the SELECT button when this item is in the display allows you to specify a measure at which you want the sequencer to continue whenever playback is started. You can use the VALUE slider or you can enter a measure number from the numeric keypad. Pressing the SELECT button once the new starting measure has been chosen sets the play pointer to this new measure. This is the same pointer that you can set in Play Mode.

## SEARCH TRACK (SEQ 15)

Pressing the SELECT button when this item is in the display allows you

to specify an event type in the current track that you want the 250 to search for. There are 17 different event types that you can search for. You can indicate the event you want to search for by scrolling through the list with the left and right arrow buttons, or you can enter a number corresponding to the event from the numeric keypad. The 17 events are:

*Remember, a note attack and a note release are two different events.*

| | |
|---|---|
| NOTE ATTACK | 1 |
| NOTE RELEASE | 2 |
| SUSTAIN | 3 |
| KEYBOARD CHANGE | 4 |
| INST CHANGE | 5 |
| TRANSPOSE | 6 |
| VOLUME | 7 |
| TEMPO | 8 |
| RHYTHM CHANGE | 9 |
| BEAT NUMBER CHANGE | 10 |
| SECTION LOOP | 11 |
| CALL SECTION START | 12 |
| CALL SECTION END | 13 |
| SECTION CALL | 14 |
| SEQUENCE CHAIN | 15 |
| SILENCE TRACK | 16 |
| TRACK END | 17 |

Pressing the SELECT button after an event type has been chosen causes the 250 to search within the current track for the next event of that type. Depending on the event type you choose you may be prompted for additional information. If the 250 finds the event you are looking for it will show its location in the display.

## MODIFY CURRENT EVENT (SEQ 16)

Pressing the SELECT button when this item is in the display allows you to modify the current event. Any of the 17 event types can be edited through this menu item. There are two main types of information you can edit—timing and specifics. Timing information is the same for all event types. An event's timing information is simply its location within the track expressed in beats and fractions. Beats are counted from beginning of the track. For example, the first beat in measure 5 of a 4/4 track will appear as beat 17 when you select it for timing assignment.

Specifics are any parameters defining an event that are not associated with timing information. Each type of event has its own set of specific parameters.

Whenever you edit an event you'll be presented first with a list of editable parameters. You can use the left and right arrow keys to scroll through the list. Once you've chosen the parameter you want to edit pressing the SELECT button again allows you to change its value. Pressing the SELECT button one more time confirms the change.

## EDITING TIMING INFORMATION

When you begin your edit, the 250 will prompt you for the type of information you want to edit. Use the left and right arrow keys to toggle between timing information and specifics. Timing information parameters are identical for all events. Use the left and right arrows to toggle between beat and fraction. Once you've chosen the desired parameter you can use the VALUE slider or the numeric keypad to set the new value.

## EDITING SPECIFIC INFORMATION

Each of the 17 event types has its own set of specific parameters that can be edited. The following is a brief description of each event type and a list of its editable parameters.

*The 250 records MIDI velocity information on a range of 0-255. Divide this number by 2 to get the equivalent MIDI velocity.*

### Note Attack (1)

This is self-explanatory. A note attack is simply the initiation of a note by a keystroke or a MIDI Note On command. The editable parameters of a note attack are: pitch (A0 to C8) and velocity (0 to 255).

### Note Release (2)

A note release is the point at which a note stops playing. The only editable parameter of a note release is pitch (A0 to C8).

### Sustain (3)

Sustain events are usually recorded as you play using the sustain pedal. Every time you depress the right pedal the 250 generates a

Sustain ON event. When you release the pedal the 250 generates a Sustain OFF event. The only editable parameter of a sustain event is its state, ON or OFF.

### Keyboard Change (4)

When you first record a track, the sound you play is taken from the current Keyboard. As soon as you record a track this becomes the default Keyboard for that track. You can change Keyboards while recording, and the change will be recorded. Once recorded, to change Keyboards in the middle of a track a Keyboard Change event must be inserted. Any Keyboard may be inserted at any point in a track. The editable parameters are the Keyboard number (if any), the MIDI program change number, and whether the program change will be sent over MIDI.

### Instrument Change (5)

Like a Keyboard Change event, an Instrument Change event can be used to modify the sound being played on a sequencer track. An Instrument Change event assigns a different Instrument to the current track. Any Instrument may be inserted at any point in a track. The only editable parameter of an Instrument Change event is the Instrument number.

### Transpose (6)

A Transpose event causes all notes following it to be transposed by the amount you specify here. The only editable parameter of a Transpose event is the transposition amount in half steps (-88 to 88).

### Volume (7)

A Volume event causes all notes following it to be played louder or softer according to the amount of the volume change you specify here. The only editable parameter of a Volume event is the amount of the volume adjustment (-128 to 127).

### Tempo (8)

A Tempo event causes the tempo of the current sequence to speed up or slow down according the amount of tempo change you specify

here. The only editable parameter of a Tempo event is the amount of the tempo adjustment (-128 to 127). Tempo changes, although they occur in specific tracks, are applied globally to the entire sequence. Individual tracks cannot have individual tempi.

### Rhythm Change (9)

A Rhythm Change event allows you to edit the time signature, and any of the quantization parameters applied to a track at a given point in time. For a list of the editable parameters and more detailed information on all of these options see RHYTHM OPTIONS (SEQ 5 and SEQ 37 through SEQ 41).

### Beat Number Change (10)

A Beat Number Change Event can be used to reset the beat counter of an individual track. Each track in the 250 sequencer has its own individual timing clock. By inserting Beat Number Change events you can alter the timing of all the events in an individual track relative to other tracks. By using Beat Number Change events you can slide a track forward or backward in time by any number of beats. You can edit timing and specifics for Beat Number Change events. You can insert a measure of rest at the beginning of a track, for example, by inserting a Beat Number Change at the first beat in the sequence and setting its timing to beat 5 (assuming that you were in 4/4 time).

### Section Loop (11)

A Section Loop event will cause the 250 to play from one point in a track (the loop start point) to another point in the track (the loop end point) and then to repeat this section a specified number of times. Whenever you create or modify a Section Loop you'll be prompted for six parameters in this order: (1) **TIMES TO PLAY LOOP**—the number entered here determines the number of times the defined section will repeat, (2) **END BEAT**—the number entered here determines the beat location of the loop end point, (3) **START BEAT**—the number entered here determines the beat location of the loop start point, (4) **LOOP EVENT COUNT**—this number (usually set for you by the 250) is the number of events that occur within the loop, (5) **END FRACTION**—the number entered here determines the fraction location of the loop end point, (6) **START FRACTION**—the number entered here determines the fraction location of the loop start point.

### Call Section Start (12)

A Call Section Start event marks the beginning of a "callable" section of music. The two editable parameters of a Call Section Start event are: its section number and play status. The section number (1 to 127) is used to identify the section when it is called with a Section Call event. After entering the section number you will be prompted for the section's play status with the question: **SECTION PLAYS IF NOT CALLED?** Pressing the YES button will cause the section to be played whether it is called or not. Pressing the NO button will cause the section to be muted unless it is called.

### Call Section End (13)

*The ability to call other sections of a sequence and to chain sequences together sets the 250's internal sequencer apart from most other sequencers.*

A Call Section End event marks the ending of a "callable" section of music. The only editable parameter of a Call Section End event is the section number (1 to 127) which is used to identify the section when it is called with a Section Call event.

### Section Call (14)

A Section Call event can be used to trigger one section of a sequence from another. When the sequencer encounters a Section Call event another part of the music (the called section) begins to play. When the called section is finished, play resumes at the next event in the track directly following the Section Call event. A called section can consist of any number of contiguous events on a given track in the current sequence.

### Sequence Chain (15)

A Sequence Chain event can be used to link one sequence to another. By using Sequence Chain events several short, independently composed pieces of music can be combined into one long composition. When the sequencer encounters a Sequence Chain event, playback of the current sequence ends immediately and playback of the chained sequence begins. Unlike a Section Call, playback will not resume with the next event in the original sequence when the chained sequence has concluded. The only editable parameter of a Sequence Chain event is the number of the sequence to be chained.

### Silence Track (16)

A Silence Track event causes all sustaining notes in the current track to be turned off. It is used primarily by the sequencer itself during punch-in recording to ensure that the releases of notes that had been turned on but not turned off, just prior to the punch-in point. A Silence Track event is placed in a track at the punch-in point every time punch-in recording is used. Only the timing information of a Silence Track event can be altered. Silence Track events have no editable specific parameters.

### Track End (17)

This is another event used by the 250 sequencer. Every track has a Track End event. The sequencer inserts a Track End event after the last event in each track. When the sequencer encounters a Track End event playback is stopped. Only the timing information of a Track End event can be altered. Track End events have no editable specific parameters.

## INSERT EVENT (SEQ 17)

*When entering events with INSERT EVENT, don't forget to enter a note release for every note attack that you place in a track.*

Pressing the SELECT button when this item is in the display allows you to insert a single event in front of the event at the current position of the edit pointer. When inserting you should always scroll forward (toward the end of the sequence) with the right arrow key, to make sure your events are inserted properly. When an event is inserted it is always given the beat number of the event that precedes it and a fraction of 0. When inserting an event you will be prompted for the type of event to be inserted as in SEARCH TRACK (SEQ 15). When you have selected the type of event you want to insert you will be prompted for any additional specific information that is required. The timing information of the inserted event is determined by the position of the edit pointer. Whenever you insert an event you will need to edit its timing field in order to place it exactly where you want it.

For a list of the events that can be inserted and a complete description of each event type see MODIFY CURRENT EVENT (SEQ 16).

## ERASE EVENT (SEQ 18)

Pressing the SELECT button when this item is in the display allows the

*If you erase a note release, don't forget to erase its attack as well.*

user to erase the current event. When the SELECT button is pressed the current event appears in the display. Pressing any button on the front panel causes the 250 to respond with: **ERASE THIS EVENT?** Pressing the YES button erases the current event and calls the next event into the display. Pressing the NO button does not erase the event and returns you to the menu heading.

## ERASE TRACK (SEQ 19)

Pressing the SELECT button when this item is in the display allows you to erase a track from the current sequence. You are prompted for the number of the track you want to erase. You can enter the number with the VALUE slider or you can enter it with the numeric keypad. Once the track number has been entered, pressing the SELECT button causes the 250 to inquire whether you really want to erase the selected track. Pressing the YES button erases the track. Pressing the NO button does not erase the track.

## RENAME TRACK (SEQ 20)

*If you don't name your tracks, the 250 will name them for you.*

Pressing the SELECT button when this item is in the display allows you to rename the current track. When the SELECT button is pressed the 250 prompts you for a new name. You can use the ALPHA slider to edit each character in the name. To move to the right from one character to the next press the ALPHA button. When a track is recorded it is given a default name (TRACK 1, for example) which simply reflects the order in which it was recorded.

## CLONE TRACK (SEQ 21)

*Before editing a track its a good idea to make a clone of it.*

Pressing the SELECT button when this item is in the display allows the user to make an exact copy (a clone) of an existing track in the current sequence. When the SELECT button is pressed the user is prompted for the number of the track to be cloned. You can use the VALUE slider to enter the track number or you can enter it from the numeric keypad. Once the track number is entered, pressing the SELECT button copies that track to an existing empty track. No track can be cloned unless an empty track exists.

## PUNCH-IN RECORDING MODE (SEQ 22)

Pressing the SELECT button when this item is in the display allows you to punch-in to an existing track to add new data (merge mode) or to record over existing data (erase mode). Pressing the SELECT button causes the 250 to prompt you for the punch-in record mode. Use the arrow keys to toggle between erase mode and merge mode. The default is erase mode.

## SELECT PUNCH CHANNEL (SEQ 23)

Pressing the SELECT button when this item is in the display allows you to select a channel for punch-in recording. You can use the left and right arrow keys scroll through the list of channels. The choices are the Performance Keyboard and MIDI channels 1-16. The default is the Performance Keyboard.

**RMX**

NOTE: RMX owners will need to set this option to match the transmission channel of their keyboard controller.

## A FEW NOTES ABOUT PUNCH-IN RECORDING

You must generate at least one event during punch-in recording to start the recording process. If you don't do anything the 250 assumes that you did not want to do the punch-in.

If you do a punch-in on a track with a different Keyboard than the one assigned to it your punch-in material will play back with the original Keyboard, not the one you recorded with.

*Be careful when punching in to a loop.*

It is possible to do a punch-in during a loop but only events generated during the first pass will be recorded. Also, if you add events to a loop (with merge mode) you must go back in and edit the NUMBER OF EVENTS IN LOOP item (see MODIFY CURRENT EVENT (SEQ 16)) to reflect the added data. To update this number search for the appropriate Section Loop event, select the NUMBER OF EVENTS IN LOOP item, and use the VALUE slider to set this to its maximum value.

## EDIT TRACK PITCH BEND (SEQ 24)

Pressing the SELECT button when this item is in the display allows you to edit pitch bend data in the current track. There are three sub-menus.

## REMOVE PB FROM TRACK (SPB 1)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you with this question: **ERASE PITCH BEND FROM CURRENT TRACK?** Pressing the YES button erases all pitch bend data from the current track.

## SET PB RECORD RESOLUTION (SPB 2)

*If you are short on memory, you may want to adjust the pitch bend record resolution.*

Pressing the SELECT button when this item is in the display allows you to set the pitch bend record resolution. The pitch bend record resolution determines how fast (and, by implication, how much) pitch bend data gets recorded. You can use the VALUE slider to enter a number from 0 to 127 or you can enter a number from the numeric keypad. Once the number has been entered, pressing the SELECT button sets the pitch bend record resolution. A value of 0 sets the 250 sequencer to record pitch bend data at the maximum rate. Because sequencer memory is limited and pitch bend is such a data-intensive event type you may wish to use a higher value (lower resolution) to conserve memory, especially when recording large sequences. The default value is 1.

## ENABLE/DISABLE PB RECORD (SPB 3)

Pressing the SELECT button when this item is in the display allows you to enable or disable the recording of pitch bend information. Use the left and right arrow keys to toggle between ON and OFF. Selecting ON enables pitch bend recording, selecting OFF disables pitch bend recording. The default value is ON.

## EDIT SEQ CONTROLS (SEQ 25)

Pressing the SELECT button when this item is in the display allows the user to modify recording and playback of continuous controller (CC) events. There are four sub-menus.

## REMOVE CC FROM TRACK (SCC 1)

Pressing the SELECT button when this item is in the display causes the 250 to prompt with this question: ERASE CONTROLLER FROM CURRENT TRACK? Pressing the YES button allows you to scroll through the list of controller types to select the one you want to erase. The available controller types are:

| | |
|---|---|
| ALL FUNCTIONS | 0 |
| VIBRATO RATE | 1 |
| VIBRATO DEPTH | 2 |
| TREMOLO RATE | 3 |
| TREMOLO DEPTH | 4 |
| NOT AVAILABLE | 5 |
| CHANNEL VOLUME | 6 |
| SEQUENCE VOLUME | 7 |
| MIDI IN VOLUME | 8 |
| SEQUENCE START | 9 |
| CHORUS DELAY | 10 |
| MUTE | 11 |
| SUSTAIN | 12 |
| BRIGHTNESS | 13 |
| MONO PRESSURE OUT | 14 (not in use) |

Choosing a controller type and pressing the SELECT button erases all events of this type from the current track. Choosing ALL FUNCTIONS erases all continuous controller data from the current track.

## SET CC RECORD RESOLUTION (SCC 2)

*As with pitch bend data, you may want to change the record resolution here if you are low on sequence memory.*

Pressing the SELECT button when this item is in the display allows you to set the continuous controller record resolution. The continuous controller record resolution determines how fast (and, by implication, how much) continuous controller data gets recorded. You can use the

VALUE slider to enter a number from 0 to 127 or you can enter a number from the numeric keypad. Once the number has been entered pressing the SELECT button sets the continuous controller record resolution. A value of 0 sets the 250 sequencer to record continuous controller data at the maximum rate. Because sequencer memory is limited and continuous controllers are such data-intensive event types, you may wish to use a higher value (lower resolution) to conserve memory, especially when recording large sequences.

### ENABLE/DISABLE CC RECORD (SCC 3)

Pressing the SELECT button when this item is in the display allows you to enable or disable the recording of continuous controller information. Use the left and right arrow keys to toggle between ON and OFF. Selecting ON enables continuous controller recording, selecting OFF disables continuous controller recording.

### HIDE CONTROLLER EVENTS (SCC 4)

Pressing the SELECT button when this item is in the display allows you to change the way continuous controller information is displayed in the event list. You can use the left and right arrow keys to toggle between hiding controller events, ON, and showing controller events, OFF. When HIDE CONTROLLER EVENTS is ON you will not see controller events in the display when you scroll through the event list for the current track.

### EDIT TRACK MONO PRESSURE (SEQ 26)

This feature is not currently implemented but is available for possible future enhancement.

### RECHAIN SEQUENCE (SEQ 27)

Pressing the SELECT button when this item is in the display allows you to chain a previously saved sequence to the current sequence. You can use the up and down arrow keys to scroll through the list of available sequences or you can enter the number from the numeric keypad.

## EDIT LOOP (SEQ 28)

This option functions identically to the Section Loop event in the insert event sub-menu. Use this option when you want to edit a loop which already exists in a track. Please refer to that section of this chapter for the loop editing options.

## CONTINUOUS RECORD LOOP (SEQ 29)

*Recording in a loop is fun. You can build complex compositions quickly and easily.*

Pressing the SELECT button when this item is in the display allows you to set up a continuous loop for recording new information. Initially, you'll be asked to enter the number of beats in the loop. Use the VALUE slider or enter the number from the numeric keypad. This determines the length of the loop. Once the loop has been set, recording on that track will take place in a loop—each time the sequencer repeats the loop any information you play will be added and merged with previous information. Looping is very useful when you are building up complicated percussion tracks.

## COPY SECTION TO TRACK (SEQ 30)

Pressing the SELECT button when this item is in the display allows you to copy music from one track or sequence to another. In order to perform this operation the 250 needs several pieces of information. Each time you press the SELECT button you'll be prompted for more information until the operation can be carried out.

You'll first be asked if you want to **COPY SECTION TO CURRENT POINT IN TRACK?** Pressing the YES button tells the 250 you want the new material copied to the current position of the edit pointer. Pressing the NO button aborts the entire copy operation. If you answered YES, you'll be asked to choose a sequence you want to copy from. Use the VALUE slider or the numeric keypad to choose a sequence. Then you'll choose a track within that sequence to copy from the start measure and end measure. Once you've made these choices, pressing the SELECT button copies the selected section into the existing track starting at the position of the edit pointer.

## VOLUME ADJUST TRACK (SEQ 31)

Pressing the SELECT button when this item is in the display allows you to adjust the volume of the current sequence track. Once this option has been selected use the VALUE slider or the numeric keypad to enter the volume adjustments. The range of values is -128 to 127. Positive adjustments increase the volume of a track, negative adjustments decrease the volume of a track.

This is not a true volume adjustment. When you adjust the volume of a track you are really adjusting note attack velocities. Consequently, your ability to effectively adjust a track's volume depends on the degree to which the Keyboard being used on that track is sensitive to changes in velocity. The more a Keyboard reacts to changes in velocity the more effective this kind of adjustment will be. If you are sequencing with a Keyboard that has no velocity sensitivity your volume adjustments will have no effect. Also, there will be a point at which greater volume adjustments have no effect. A note velocity cannot exceed a value of 255, so any adjustment over that amount will have no audible effect.

*Remember, the 250 sequencer records velocity at twice the resolution of MIDI.*

The best way to make a volume adjustment is in real time as the sequence is playing back. To do this, start the sequence and while it is playing select VOLUME ADJUST TRACK (SEQ 31) and adjust its volume relative to the other tracks as the sequence is playing.

## MUTE TRACK (SEQ 32)

Pressing the SELECT button when this item is in the display allows you to mute individual sequence tracks. The 250 will prompt you first for the track you want to mute and then you'll be asked to turn the mute ON or OFF. Use the left and right arrows to toggle between the options. Like other YES/NO or ON/OFF propositions, remember to read the question carefully. In this case, you are setting the state of the mute. Selecting ON will cause the track not to be played (the mute will be ON), selecting OFF will cause the track to be played (the mute will be OFF). This change can also be made while the sequence is playing back.

## SOLO TRACK (SEQ 33)

*With mute, solo, and volume adjustments, you can use the 250 sequencer like a sophisticated digital mixer.*

Pressing the SELECT button when this item is in the display allows you to solo individual sequence tracks. The 250 will prompt you first for the track you want to solo and then you'll be asked to turn the solo ON or OFF. Use the left and right arrows to toggle between the options. Like other YES/NO or ON/OFF propositions, remember to read the question carefully. In this case, you are setting the state of the solo. Selecting ON will cause the track to be soloed (the solo will be ON), selecting OFF will cause the track note to be soloed (the solo will be OFF). This change can be made while the sequence is playing back.

## THE MIXBOARD

*The Mixboard is comprised of these 12 buttons: CONTINUE, LOOP, SAVE, ERASE, MIDI, SYNC, TEMPO UP, TEMPO DOWN, SET POINTER, INSERT, READ, and SEND.*

Track muting can be done in real time using the 250's Mixboard feature. When the 250 sequencer is on, and you are not inthe Sequence Editor, pressing the SEARCH button turns on the Mixboard. This disables the show channels feature. The Mixboard consists of the 6 pairs of buttons in the lower right hand corner of the front panel. These 12 buttons correspond to the 12 sequencer tracks. Tracks 1-6 are controlled by the top row of buttons, tracks 7-12 are controlled by the bottom row. Buttons corresponding to recorded tracks will be lit. Pressing a button unlights it. When a button is lit its corresponding track will play. When a button is unlit its track will be muted.

## TRANSPOSE TRACK (SEQ 34)

Pressing the SELECT button when this item is in the display allows you to transpose the current track. Use the VALUE slider to enter the transposition amount in half steps from -88 to 88. All note events in the track will be immediately transposed by this amount. Notes falling outside the range of the 250 (A0 to C8) will be assigned the highest (C8) or lowest (A0) possible pitches. This change can be made while the sequencer is playing.

## TRACK DEFAULT KBD (SEQ 35)

Pressing the SELECT button when this item is in the display allows you to assign any 250 Keyboard to be the default Keyboard for a sequence

track. You can use all four of the arrow keys to scroll through the list of Keyboards or you can enter the number with the numeric keypad. Pressing the SELECT button sets the chosen Keyboard as the default Keyboard for the current sequencer track. Changes made to the default Keyboard do not affect previous Keyboard change events placed in the track.

## ASSIGN INST TO TRACK (SEQ 36)

*Remember, an Instrument is basically just a collection of effects settings.*

Pressing the SELECT button when this item is in the display allows you to assign an Instrument to a sequencer track. The 250 will prompt you with the question: **ASSIGN INST TO TRACK TO CONTROL EFFECTS?** Pressing the NO button will cancel this operation. Pressing the YES button will allow you to select an Instrument for the current track. Use the arrow keys or the numeric keypad to choose an Instrument. Once you've chosen an Instrument, pressing the SELECT button will apply that Instrument to the Keyboard in the current track. When a new Instrument is assigned to a track all previous Instrument change events are ignored and have no effect.

## SET TIME SIGNATURE (SEQ 37)

*You can set up some really wild time signatures.*

Pressing the SELECT button when this item is in the display allows you to set the time signature of the current sequence. The 250 will prompt you first for the numerator and then for the denominator of the new time signature. You must use the numeric keypad to enter the time signature values. Any number from 1 to 255 can be placed in the numerator or denominator. Any subsequent sequences you record will have this time signature.

## SET SEQUENCE TEMPO (SEQ 38)

Pressing the SELECT button when this item is in the display allows you to set the tempo of the current sequence. You can use the VALUE slider or the numeric keypad to enter the tempo you want. The range is 10 bpm to 800 bpm. Any subsequent sequences you record will have this tempo. You can change the tempo in real time as the sequence plays back by pressing the TEMPO UP and TEMPO DOWN buttons. Real time tempo changes are in effect only during playback.

## SET/CLEAR QUANTIZATION (SEQ 39)

Pressing the SELECT button when this item is in the display allows you to set the quantization unit for the current track. You can use the VALUE slider or numeric keypad to enter the quantization unit. You can enter any number from 0 to 255 for the quantization unit. Here is a list of the values you will probably work with most frequently:

| | |
|---|---|
| 0 | NO QUANTIZATION |
| 1 | WHOLE NOTE |
| 2 | HALF NOTE |
| 4 | QUARTER NOTE |
| 8 | EIGHTH NOTE |
| 16 | SIXTEENTH NOTE |
| 32 | THIRTY-SECOND NOTE |
| 64 | SIXTY-FOURTH NOTE |

Quantization (sometimes called "auto-correction") is a means of altering the placement of notes in time. When a track is quantized all note events are moved from their current location to imaginary grid points. The location of these grid points is determined by the quantization unit set here in SET/CLEAR QUANTIZATION (SEQ 39). When the quantization unit is set to a 16th note all notes move to the nearest 16th note. When the quantization unit is set to a 32nd note all notes move to the nearest 32nd note, and so on.

*Use quantization with care.*

Because the 250 treats note attacks (note on events) and note releases (note off events) as separate events, both the attacks and releases are moved to the nearest grid points. This can cause some unexpected results. First of all, quantization affects duration. When note attacks and note releases are moved to their nearest respective grid points the duration of the notes will change (sometimes drastically) because the attacks and releases will invariably be moved by different amounts. This can cause noticeable changes in the articulation of a passage. Furthermore, if there are notes within a track which have durations less than half the quantization unit, quantization can cause them to disappear entirely. When short notes are quantized there is always the possibility that a note attack and its note release will be moved to the same grid point resulting in a note with no duration at all. Quantization, then, should be used with care and is probably best suited for

percussion tracks where note duration is less important.

## SET QUANTIZATION DELAY (SEQ 40)

Pressing the SELECT button when this item is in the display allows you to set the quantization delay for the current track. The quantization delay shifts the notes in the quantized section forward or backward in time according to the amount of the delay.

*A good drummer always "lays back" on 2 and 4. Use quantization delay to get this effect.*

The quantization delay shifts the imaginary grid set up by the quantization level. If the quantization level was set for 8th notes and the quantization delay was set for 32nd notes, all note events would first be moved to their nearest 8th note divisions and then moved later in time by a 32nd note. You can use quantization delay to add life to your sequences (especially drum tracks) by delaying different tracks by different amounts, simulating the experience of individual players who might each have a slightly different sense for the placement of the beat and the rhythmic feel. Some players have a tendency to rush, while others drag. Quantization delay can be used to give each track its own unique rhythmic personality.

The quantization delay should never be set to more than half the quantization amount. In other words, if you have quantized to a 16th note, you should not set the delay to more than a 32nd note. Doing so can cause undesirable results.

## SET QUANT DURATION (SEQ 41)

Pressing the SELECT button when this item is in the display allows you to set the quantization duration for the current track. This works similarly to quantization delay but instead of moving both the note attack and note release, this parameter only affects duration. When quantization duration is applied the duration of the notes is shortened by the duration amount measured from the quantized start of the note. This can be used to change the articulation of a quantized passage.

## SET TRACK MIDI MODES (SEQ 42)

Pressing the SELECT button when this item is in the display allows you

to set the MIDI playback mode for the current track. There are three choices. Use the left and right arrow keys to scroll through the list:

*If you are haveing sequencing external MIDI devices, check these settings.*

| | |
|---|---|
| 250 ONLY, NO MIDI | 0 |
| MIDI ONLY, NO 250 | 1 |
| 250 AND MIDI | 2 |

Selecting 250 ONLY, NO MIDI causes all sequence data for the current track to be played back only on the 250. Selecting MIDI ONLY, NO 250 causes all sequence data for the current track to be played back only over MIDI according to the assigned MIDI channel for that track. Selecting 250 AND MIDI causes the current track to be played back on the 250 and over MIDI according to the assigned MIDI channel for that track.

## SET MIDI PLAY CHANNEL (SEQ 43)

Pressing the SELECT button when this item is in the display allows you to set the MIDI playback channel for the current track. Use the VALUE slider or the numeric keypad to select the MIDI channel. In order for sequence data to be sent out over the assigned MIDI channel the proper MIDI mode must be set. See SET TRACK MIDI MODES (SEQ 42) for more information.

## SET MIDI RECORD ON/OFF (SEQ 44)

Pressing the SELECT button when this item is in the display allows you to enable or disable the recording of MIDI events from external MIDI devices. When MIDI recording is ON, the 250 sequencer will record MIDI data from another MIDI device. When MIDI recording is OFF, the 250 sequencer ignores incoming data from other MIDI devices. The default is ON.

## SET SEQ DEFAULT MIDI (SEQ 45)

*This feature will get you up and running quickly.*

Pressing the SELECT button when this item is in the display allows you to instantly assign each sequence track to its own MIDI channel. The 250 will prompt you with this question: ASSIGN EACH TRACK TO LIKE MIDI CHANNEL? Pressing YES will automatically assign each

track to its own individual MIDI channel. Track 1 will be assigned to Channel 1, Track 2 to Channel 2, and so on.

## SEQUENCER SYNC MODE (SEQ 46)

Pressing the SELECT button when this item is in the display allows you to set the synchronization mode for the 250 sequencer. There are five options:

| | |
|---|---|
| NONE | 0 |
| PULSE SYNC SLAVE | 1 |
| PULSE SYNC MASTER | 2 |
| MIDI IN SLAVE | 3 |
| MIDI OUT MASTER | 4 |

Selecting NONE (the default setting) means the 250 will neither send nor receive synchronization information.

Selecting PULSE SYNC SLAVE means that on playback the 250 sequencer will not start until it receives the proper sync tone at the SYNC IN jack on the rear panel. If synchronization fails use a soft reset (press SELECT, 4, 5 simultaneously) to regain control of the 250 without disturbing the contents of the sequencer memory.

Selecting PULSE SYNC MASTER is used to generate the 250 sync tone onto one track of a tape recorder for sync-to-tape operations. When this mode is selected the sync tone will be present at the SYNC OUT jack on the rear panel during sequence playback.

*If you have a problem while using synchronization, use a soft resest to get going again.*

Selecting MIDI IN SLAVE means that on playback the 250 sequencer will not start until it receives a MIDI start command followed by MIDI clock pulses. If synchronization fails use a soft reset (press SELECT, 4, 5 simultaneously) to regain control of the 250 without disturbing the contents of the sequencer memory.

Selecting MIDI OUT MASTER means that the 250 sequencer will send appropriate synchronization information over MIDI to synchronize other devices during playback.

The 250 sequencer has full support for MIDI Song Position Pointer in both slave and master modes. Through MIDI Song Position Pointer it is

*With a SMPTE-to-MIDI converter it is possible to sync the 250 to SMPTE time code for film and video work.*

possible to synchronize the 250 to SMPTE time code. In order to do this, however, you must use an extra piece of hardware called a SMPTE-to-MIDI converter. Most current SMPTE Reader/Generators support SMPTE-to-MIDI conversion. The 250 does not support MIDI Time Code.

## SET SYNC CLOCK RATE (SEQ 47)

Pressing the SELECT button when this item is in the display allows you to set the sync clock rate for both slave and master sync modes. Use the VALUE slider to set the external sync clock to any rate between 24 pulses per quarter note and 384 pulses per quarter note.

## SET TRIGGER IN MODE (SEQ 48)

Pressing the SELECT button when this item is in the display allows you to set the trigger in mode for the 250 sequencer. There are three options:

| | |
|---|---|
| NO EFFECT | 0 |
| START PLAYBACK | 1 |
| START RECORD | 2 |

Selecting NO EFFECT means that an electrical signal sent from a foot pedal (or other device) present at the TRIGGER IN jack on the back panel will have no effect on sequencer operation.

Selecting START PLAYBACK means that the 250 sequencer can be started (triggered) by generating an electrical signal with a foot pedal. In this mode, depressing a foot pedal connected to the TRIGGER IN jack will start sequencer playback.

Selecting START RECORD means that recording can be started (triggered) on the 250 sequencer by generating an electrical signal with a foot pedal. In this mode, depressing a foot pedal connected to the TRIGGER IN jack will start recording.

## SET PLAY START MODE (SEQ 49)

Pressing the SELECT button when this item is in the display allows you

to set the play start mode for the 250 sequencer. There are three options:

| | |
|---|---|
| PLAY BUTTON | 1 |
| LEFT PEDAL | 2 |
| NEXT NOTE PLAYED | 3 |

Selecting PLAY BUTTON (the default) means that the PLAY button must be used to start sequence playback.

*Use the LEFT PEDAL when your hands are busy at the keyboard.*

Selecting LEFT PEDAL means that once the PLAY button is pressed the left pedal must be depressed to start sequence playback. This assumes that the Left Pedal has been assigned to SEQUENCE START in the Assignable Controls Editor.

Selecting NEXT NOTE PLAYED means that any note on the Keyboard can be used to start sequence playback once the PLAY button is pressed.

## SET RECORD START MODE (SEQ 50)

Pressing the SELECT button when this item is in the display allows you to set the record start mode for the 250 sequencer. There are three options:

| | |
|---|---|
| RECORD BUTTON | 1 |
| LEFT PEDAL | 2 |
| FIRST NOTE | 3 |

Selecting RECORD BUTTON (the default) means that the RECORD button must be used to start sequence recording.

Selecting LEFT PEDAL means that the left pedal must be depressed to start sequence recording. This assumes that the Left Pedal has been assigned to SEQUENCE START in the Assignable Controls Editor.

Selecting FIRST NOTE means that recording will start with the first note played on the 250 keyboard.

## ENABLE/DISABLE CLICK (SEQ 51)

Pressing the SELECT button when this item is in the display enables or

disables the 250's built-in metronome click. Selecting ON enables the metronome click. When click enable is ON the sound of the metronome will be present at the CLICK OUT jack on the rear panel every time the sequencer goes into record mode. When click enable is OFF the metronome click will not be heard.

### SAVE CURRENT SEQUENCE (SEQ 52)

Pressing the SELECT button when this item is in the display allows you to save the current sequence to the 250's sequence library. Before saving, the 250 will display the number of the current sequence and give you a chance to change it if you want. You must use the numeric keypad to change the number of your sequence. Once the number is chosen, pressing the SELECT button saves the current sequence and empties the sequence edit buffer. To edit the sequence you have just saved (or any other sequence) you must load it again from the sequence library with LOAD SEQ TO EDIT (SEQ 9).

### RENAME CURRENT SEQUENCE (SEQ 53)

This option doesn't work the way you think it does. The only way to rename a sequence is to follow this procedure: Turn the Sequencer on (but do not enter the Sequence Editor), press the LIST button and select a sequence from the List. Now, enter the Sequence Editor and go immediately to RENAME CURRENT SEQUENCE (SEQ 53). (Do not go to LOAD SEQUENCE TO EDIT). Now you can rename the selected sequence. Be sure there are no unsaved sequences in the buffer before you rename a sequence.

*Renaming a sequence is a little tricky, but once you've practiced it a little it's really no problem.*

Press the SELECT button and you can give your sequence a new name by using the ALPHA slider to scroll through the list of available characters and then hit the ALPHA button to move to the next character in the name.

### ERASE SEQUENCE (SEQ 54)

Pressing the SELECT button when this item is in the display allows you to erase the current sequence. The 250 will ask you if you want to erase the current sequence. Pressing the YES button will erase the

current sequence. Pressing the NO button will abort the operation.

## CLEAR SEQUENCER MEMORY (SEQ 55)

Pressing the SELECT button when this item is in the display allows you to erase all sequences from the library and the edit buffer. When you choose this option you'll be asked: **DO YOU REALLY WANT TO ERASE ALL SEQUENCES???** Pressing the YES button will erase all sequences from the sequencer memory. Pressing the NO button will abort the operation.

## SHUFFLE DIRECTORY ITEMS (SEQ 56)

Pressing the SELECT button when this item is in the display allows you to shuffle or swap the items (sequences) in the 250 sequence library. If you have many sequences in memory you may want to reorder them. That's what this item does. The 250 lets you move sequences in the sequence library by swapping one sequence with another. You will first be prompted for the number of the first sequence to be swapped. You'll then be prompted for the number of the second sequence to be swapped. When you've entered numbers for both sequences pressing the SELECT button swaps the two sequences in memory by exchanging their sequence numbers.

## GETTING AROUND WITH THE FRONT PANEL BUTTONS

In several of the editors it is possible to go directly to a particular menu item by pressing the appropriate front panel button. The button assignments for the Sequence Editor are listed below. Learning the buttons and their assignments in each of the editors can help you to move around more efficiently.

## SEQUENCE EDITOR BUTTON ASSIGNMENTS

| Pressing This Button | Takes You to This Item |
|---|---|
| SLIDER SELECT #1 | RENAME TRACK (SEQ 20) |

| | |
|---|---|
| SLIDER SELECT #2 | CLONE TRACK (SEQ 21) |
| SLIDER SELECT #3 | ERASE TRACK (SEQ 19) |
| ALPHA | RENAME CURRENT SEQUENCE (SEQ 53) |
| VALUE | DISPLAY SEQ STATUS (SEQ 11) |
| DETUNE | SET TIME SIGNITURE (SEQ 37) |
| LEFT PEDAL | SET PLAY POINTER (SEQ 14) |
| EXTERNAL PEDAL | PUNCH IN RECORDING MODE (SEQ 23) |
| RIGHT PEDAL | ERASE TRACK (SEQ 19) |
| LEFT LEVER | SET QUANT DURATION (SEQ 41) |
| RIGHT LEVER | EDIT TRACK PITCH BEND (SEQ 22) |
| CHORUS | SOLO TRACK (SEQ 33) |
| LEVEL | ENABLE/DISABLE CLICK (SEQ 51) |
| TRANSPOSE UP | VOLUME ADJUST TRACK (SEQ 31) |
| TRANSPOSE DOWN | TRANSPOSE TRACK (SEQ 33) |
| SELECT | LOAD SEQ TO EDIT (SEQ 9) |
| KEYBOARD | TRACK DEFAULT KBD (SEQ 35) |
| INSTRUMENT | ASSIGN INST TO TRACK (SEQ 36) |
| SEQUENCE | COPY SECTION TO TRACK (SEQ 30) |
| RECORD | CONTINUOUS RECORD LOOP (SEQ 29) |
| CONTINUE | START/STOP SEQUENCE (SEQ 10) |
| LOOP | RE-CHAIN SEQUENCE (SEQ 28) |
| TEMPO UP | SET/CLEAR QUANTIZATION (SEQ 39) |
| TEMPO DOWN | SET SEQUENCE TEMPO (SEQ 38) |
| EDIT | MODIFY CURRENT EVENT (SEQ 16) |
| SEARCH | SEARCH TRACK (SEQ 15) |
| SAVE | SAVE CURRENT SEQUENCE (SEQ 52) |
| ERASE | ERASE EVENT (SEQ 18) |
| SET POINTER | SET EDIT POINTER (SEQ 13) |
| INSERT | INSERT EVENT (SEQ 17) |
| LIST | SHUFFLE DIRECTORY ITEMS (SEQ 56) |
| MIDI | SET TRACK MIDI ITEMS (SEQ 42) |
| SYNC | SEQUENCER SYNC MODE (SEQ 46) |
| READ | LOAD SEQ TO EDIT (SEQ 9) |
| SEND | LOAD TRACK TO EDIT (SEQ 12) |

# *Sampling on the 250*

# 9

*Chapter Nine*

# *Sampling on the 250*

## *Overview*

### DESCRIPTION

Sampling is the process of converting sound into a digital format. This process, called analog-to-digital conversion, is carried out in the 250's digitizer. By attaching a microphone to the back of the 250, or into the line in jack from a line level source such as a tape deck or a CD player, you can record sounds that you will be able to edit and play from the keyboard.

A sample is nothing more than a short recording. When you depress a key on the keyboard the 250 is really just playing back a very short digital recording. Of course there's more to it than that. The sound that actually comes out is a product of the sound itself as it was recorded and the way the 250 plays it.

*Don't miss "Tips From the Master" at the end of this chapter!*

Sounds can be looped and reversed. When a sound is looped the 250 will start playing at the beginning of the sound and keep going until it reaches a point that marks the end of the loop. Then, it will turn around and immediately return to a point that marks the beginning of the loop. It will cycle between these two points until you lift your finger from the keyboard. When a sound is reversed, the 250 plays the recording in reverse from back to front.

The ability to sample your own sounds on the 250 means that there is really no limit to the kinds of Instruments and Keyboards you can create. The amount of sampling memory you have is limited but you

can always add more with SUPERAM upgrades. And you can always save your sounds on a Macintosh computer with QLS. Sampling can be quite complicated but it can also be very rewarding. The ability to add new sounds to the 250 means that you can turn it into virtually any instrument you can imagine.

*Main Menus*

### RECORD SOUND (DIG 1)

This menu item is where all sound recording takes place.

### TUNE SOUND (DIG 2)

This item is used to adjust the tuning, volume, decay rate, release rate, and filter tracking of a digitized sound.

### TRIM SOUND (DIG 3)

This item is used to truncate digitized sounds.

### LOOP SOUND (DIG 4)

This menu item is used to set loops to create sustaining sounds.

### KBD EDIT OPTIONS (DIG 5)

The menu choices under KBD EDIT OPTIONS (DIG 5) perform operations such as assigning a sound to a Keyboard (DIG 10), removing a sound from a Keyboard (DIG 11), and setting the Keyboard crossover level (DIG 12).

### DELETE OPTIONS (DIG 6)

The menu choices under DELETE OPTIONS (DIG 6) perform operations such as deleting Soundfiles and Keyboards (DIG 13 and DIG 14), unlooping sounds (DIG 15), initializing the digitizer memory (DIG 16), and removing sounds from a Keyboard (DIG 17).

## DUPLICATE OPTIONS (DIG 7)

The menu choices under DUPLICATE OPTIONS (DIG 7) perform duplication operations such as duplicating sounds (DIG 18) and Keyboards (DIG 19).

## DISPLAY OPTIONS (DIG 8)

The menu choices under DISPLAY OPTIONS (DIG 8) perform display operations including displaying the amount of available memory (DIG 20), showing the roots of a digitizer Keyboard (DIG 21), and showing other Soundfile information (DIG 22).

## MISCELLANEOUS OPTIONS (DIG 9)

The menu choices under MISCELLANEOUS OPTIONS (DIG 9) perform operations such as reversing sounds (DIG 23) and renaming objects (DIG 24).

*Reference Guide*

## RECORD SOUND (DIG 1)

All sampling takes place in RECORD SOUND (DIG 1). The process of recording a sound on the 250 has many steps. At each point the 250 will prompt you for information to be entered or to perform a task such as actually recording the sound to be sampled. This process, though more involved than most other 250 operations, is very easy because the 250 tells you what to do each step of the way.

To begin sampling press the INSTRUMENT button. The 250 will take you immediately to RECORD SOUND (DIG 1). Now, press the SELECT button and follow the 250's prompts throughout the sampling process.

## CHOOSING A BANK

If you have one of the SUPERAM options the 250 will prompt you for the number of the digitizer bank into which you will be recording your

sound. You can use the left and right arrow keys to scroll through the available digitizer banks. If you do not have SUPERAM, you will proceed directly to sampling mode.

## CHOOSING A SAMPLING MODE

*These next few pages take you through the recording process.*

The 250 will prompt you to enter a number corresponding to the sampling mode the 250 will use to record your sound. You can use the left and right arrow keys to scroll through the list. There are six options:

| | |
|---|---|
| QUICK TAKE | 1 |
| DE-EMPHASIS | 2 |
| SLOW DECAY | 3 |
| NORMAL DECAY | 4 |
| FAST DECAY | 5 |
| SPEECH | 6 |

QUICK TAKE is the simplest sampling mode. It uses no special post-record signal processing. This mode produces the brightest possible samples, even brighter than the original sounds.

*See "Tips From the Master" at the end of this chapter for some extra insight into the 250's powerful sampling modes.*

DE-EMPHASIS causes the 250 to boost the high frequencies of your sound as it is recorded and then, during post-record processing, it attenuates the high frequencies to restore the original frequency balance to the sound. This results in a sound that has less extraneous noise and, in general, a better overall sound quality.

SLOW DECAY causes the 250 to compress the dynamic range of the sound during recording and to expand the dynamic range back again during post-record processing. This results in a sound with a better signal-to-noise ratio. This compression mode is optimized for sounds that have long, slow decays.

NORMAL DECAY is similar to SLOW DECAY but this compression mode is optimized for sounds with average decay times.

FAST DECAY is a compression mode that is optimized for sounds with very fast decay rates.

SPEECH is a special recording mode that is optimized for recording

human speech or sounds which have slight pauses in them. In this recording mode extremely quiet sections will be made even quieter to improve the signal-to-noise ratio.

Press the SELECT button to proceed.

## SETTING THE SAMPLING RATE

The 250 will prompt you for the sampling rate. You can use the left and right arrow keys to scroll through the list of sampling rates. The available rates are:

| | |
|---|---|
| 5000 Hz | 1 |
| 6250 Hz | 2 |
| 7500 Hz | 3 |
| 10000 Hz | 4 |
| 12500 Hz | 5 |
| 15000 Hz | 6 |
| 17500 Hz | 7 |
| 20000 Hz | 8 |
| 22500 Hz | 9 |
| 25000 Hz | 10 |
| 31250 Hz | 11 |
| 35714 Hz | 12 |
| 41667 Hz | 13 |
| 50000 Hz | 14 |

The three highest rates can only be used with QUICK TAKE and DE-EMPHASIS.

The higher the sampling rate, the better your samples will be, but a higher sampling rate means less sampling time. Each digitizer bank that you have in your 250 has room for roughly 500,000 samples. Without SUPERAM you have one bank available. With SUPERAM I you have two banks. With SUPERAM II you have four 500,000-sample banks, or 2,000,000 total samples available for recording and storing digitized Soundfiles. Without SUPERAM, at the highest rate of 50,000 Hz you have enough memory to record for 10 seconds per bank. This is about enough room to put together the entire range of one acoustic Instrument—6 to 7 samples at about 1.5 seconds each.

How high should your sampling rate be? The answer varies depending on the sound you are recording and the quality of the recording you want to achieve. The higher you set the sampling rate, the more accurately you will be able to capture the high frequencies in a sound. In general, brighter sounds require a higher sampling rate in order to reproduce them more faithfully. Bright sounds like snare drum, piano, or cymbals have a lot of high level high frequencies in them. To capture those high frequencies accurately you must use a very high sampling rate. Darker sounds like bowed cello, bowed bass, trombone, or bass drum can be recorded with a slightly lower sampling rate because they contain relatively small amounts of high frequency information. To get an idea of how sampling rate compares to quality listen to a compact disc on a good set of speakers or headphones. The sampling rate of a compact disc recording is 44,100 Hz. It stands to reason, then, that if you want your samples to approach the quality of a compact disc recording you should use either of the 250's two highest sampling rates.

*See "Tips From the Master" at the end of this chapter for recommendations on setting the sampling rate for various acoustic instruments.*

Press the SELECT button to proceed.

## SETTING THE SAMPLING TIME

The 250 will prompt you for the amount of time you want to record (in seconds). You can use the VALUE slider to enter this number. The amount of time you have depends on the amount of memory you have and the sampling rate. You should always allow for more time than you think you need. That way you have a longer recording if it turns out that you really need it and any number of extra samples at the end of the recording that you don't use can be removed by trimming the sample after it has been recorded.

*Always give yourself more time than you think you need.*

Press the SELECT button to continue.

## SETTING A RECORD TRIGGER

The 250 will prompt you for the trigger level—a threshold volume that must be crossed before recording will begin. You can use the left and right arrow keys to scroll through the list of trigger levels. The available trigger levels are:

| | |
|---|---|
| NO TRIGGER | 0 |
| 12 dB | 1 |
| 18 dB | 2 |
| 24 dB | 3 |
| 30 dB | 4 |
| 36 dB | 5 |
| 42 dB | 6 |

Once a trigger is set, recording will not begin until the input signal crosses the threshold. If you select NO TRIGGER recording will begin as soon as your press the RECORD button.

Deciding whether to use a trigger has some important implications. Often, the most important part of a sound is right at the very beginning. This is usually refered to as the attack transient because of its random quality. For instance, the chiff at the beginning of a trumpet tone is largely made up of noise and other random elements. As it turns out, these attack transients are what the brain relies upon most heavily when it tries to figure out what sound is what. So what does this have to do with selecting a trigger? If a trigger is in use, then a certain amount of the sound right at the beginning will not be recorded. The higher the trigger volume, the longer it will take the sound to build up to the point where it crosses the threshold and starts to be recorded. Sometimes just a few milliseconds at the beginning of a sound can make all the difference in the world.

So why use triggers at all? Convenience and accuracy. Once you set the trigger you've got plenty of time to set yourself up to take the sample. If you are generating the sound yourself, and both hands are involved, a trigger may be absolutely necessary. If possible, avoid using a record trigger. Give yourself a little more sampling time than you need and trigger the recording yourself. Then, once the sound has been recorded, take out the extra space at the beginning with the sample trimming option. If a trigger is absolutely necessary (you can't trigger the sound manually or you are very low on available sampling memory) but you are concerned about missing some of a sound's attack you can use the 250's pre-trigger recording option (discussed next) to solve the problem.

Press the SELECT button to continue.

## PRE-TRIGGER RECORDING

NOTE: If you have chosen NO TRIGGER, this option will not appear.

The 250 will prompt you for pre-trigger recording. You can use the left and right arrow keys to scroll through the list of pre-trigger recording options. The available pre-trigger recording options are:

| | |
|---|---|
| NONE | 0 |
| 10 MSEC | 1 |
| 20 MSEC | 2 |
| 30 MSEC | 3 |
| 40 MSEC | 4 |
| 50 MSEC | 5 |

Using pre-trigger recording is a great way to get around the dilemma of whether or not to use a recording trigger because it allows you to use a trigger and still get every bit of a sound's attack. When you use pre-trigger recording you almost never lose the beginning of a sound even if you record with a fairly high trigger threshold.

When pre-trigger recording is set, the 250 literally starts recording *before* you press the RECORD button. It does this by continuously recording sound at the audio input into a first-in-first-out circular recording buffer. You set the size of this buffer when you select one of the pre-trigger recording options. Selecting 50 msec of pre-trigger recording tells the 250 to begin recording immediately into a 50 msec buffer. The buffer is circular—as it fills up (after the first 50 msec) new samples replace the old. No matter when your sound crosses the trigger threshold and initiates the recording process you always have the most recent 50 msec of samples from before the time recording starts.

Press the SELECT button to continue.

## SETTING THE RECORD LEVEL

The 250 will ask you whether you want to check the record level. If you want to check the record level press the YES button. If you do not want to check the record level press the NO button.

Pressing the YES button turns the display into a record level meter which registers the signal at the audio input and graphically displays information (in the form of bouncing asterisks and plusses) about the level of the signal to be recorded. This meter functions similarly to the standard VU meter on a tape recorder. As you probably know, if a signal is too strong it will be distorted, if it is too weak it may sound noisy or otherwise unsatisfactory.

*Watch your levels carefully.*

The display will respond whenever the meter encounters a signal at the audio input. With the meter function on, produce the sound you will record. The top line of the display acts as a continuous level meter. It continuously monitors the input source and changes rapidly with changes in input volume. Use it to judge the overall volume of the sound during sustained portions. The bottom line of the display acts as a peak hold meter. It displays only the highest recording level (the peak) and it holds that level in the display so you can see it. Use it to judge brief moments of extremely high volume such as the attack.

When you see only asterisks in the display your sound is below the level that can potentially cause distortion. When you see plusses your sound is above that level and distortion may occur. If distortion occurs, the LEVEL (SPLIT KEYBOARD on older models) button will light. The idea is to set a recording level that registers the most asterisks without getting any plusses in the display.

If the volume of the input signal is too high (you see plusses in the display) clipping will occur and digital distortion will result. Clipping occurs when the instantaneous volume of a sound is higher than the largest number available to represent it digitally (anything above that highest value gets clipped off). The sound is distorted because the 250 can't accurately represent the instantaneous volume. If the volume of the input signal is too low (you see only one or two asterisks in the display) the recorded sound will not be loud enough to mask the noise that is always present during the sampling process. The result will be a sound that has a very poor signal-to-noise ratio.

Depending on the sampling mode, you can use one of the 250's sliders to properly set the record level. If you are sampling with QUICK TAKE or DE-EMPHASIS you can use SLIDER #3 to adjust the input gain for a proper recording level. If you are using one of the other four sampling modes adjusting SLIDER #3 has no effect. The only way to adjust the input gain is by adjusting the volume of the sound source. You'll want

the Volume Slider all the way to the right, as this improves the signal-to-noise ratio of the sample.

*Always check your levels before recording.*

Every time you get to this point in the recording process the 250 will ask you if you want to check the record level. DON'T EVER SAY NO TO THIS QUESTION. Even if you've checked the level a hundred times, check it again. There is nothing worse than getting that once-in-a-lifetime "perfect take" and getting a distorted recording because you moved a little closer to the microphone or some gremlin (probably your elbow) moved SLIDER #3 just enough to clip the signal.

When setting the record level, pressing the CHORUS button will route the sound present at the audio input through the 250's main outputs. This can be useful if you are sampling from a source which cannot be monitored any other way (a drum machine or another synthesizer, for example). Caution, this signal is hot!

Press the SELECT button to continue.

## RECORDING THE SOUND

Once the record level has been set, pressing the SELECT button causes the 250 to prompt you with the message: **Hit RECORD to start....** If you are not using a trigger, hitting the RECORD button will enable the recording process immediately. If you are using a trigger then, once you press the RECORD button, recording will begin as soon as the level of the input signal crosses the trigger threshold.

*If possible, record your sound into a digital recorder before sampling it on the 250. That's the way the pros do it.*

When the 250 has finished recording it will take a moment to process the sampled data. It will then briefly display some important information about the quality of the recording you have just made. This information will not stay in the display for very long so watch carefully. The 250 will give you either of two pieces of information: the number of times a sample was clipped or the highest value recorded for a single sample. The more clips you see, the more distorted your recording is. A few clips may be tolerable. More than 100 clips probably won't be. If clipping occurs, the highest sample value will not be displayed. Obviously, if there are any clips at all then the highest sample will have a value equal to the highest number the 250 can use to represent a sample. If there are no clips during recording, the 250 will tell you the highest value recorded for a single sample. Below is a

chart listing the six sampling modes and their ideal maximum ranges. If the highest sample you take falls within these ranges chances are you've made a pretty good recording. If clipping occurs, lower your input gain and try again. If the level is too low, raise the input gain.

*If your sample registers within these ranges you can be pretty sure that you've gotten a good take.*

| | |
|---|---|
| QUICK TAKE | 400-511 |
| DE-EMPHASIS | 400-511 |
| SLOW DECAY | 350-400 |
| NORMAL DECAY | 250-350 |
| FAST DECAY | 300-450 |
| SPEECH | 150-350 |

## PROCESSING THE SOUND

The 250 will prompt you with the message: CONTINUE Y/N? Press the NO button if you want to go back through the recording process to take another sample of your sound. The 250 will prompt you with the message: **RETAKE Y/N?** Pressing the YES button will bring up this message: **USE SAME SETUP Y/N?** Pressing the YES button will initiate the recording process with the same parameters used previously. Pressing the NO button will take you all the way back to the beginning where you can specify each of the recording parameters again.

If you think your recording was good and you want the 250 to begin any post-record processing press the YES button when you are prompted to continue after recording your sound. If you have sampled with any of the compression modes, post-record processing may take a bit of time. When the 250 starts to process your sound it will tell you how long processing will take (in minutes and seconds) and will count down from there until it is finished. Shorter samples will take just a couple of minutes; longer ones are definite coffee break material. You can rest assured, however, that your time is being well spent. The 250's post-record signal processing is a powerful and very valuable feature. Most other samplers don't have anything like it. Used appropriately, the six sampling modes will help you achieve sampled sounds of unparalleled quality.

*The compression modes take extra processing time, but they're worth it!*

## PLAYING THE SOUND

Once all post-record processing has been completed the 250 will

prompt you with the message: **Preview root at C4. Hit SELECT to continue**. At this point, you can play your sound monophonically or polyphonically to get an idea of how it sounds. The 250 has actually assigned your sound to a special Keyboard called the DIG PREVIEW KBD.

## SAVING AND ASSIGNING THE SOUND

When you have finished playing, press the SELECT button. The 250 will prompt you to save the sound you have recorded; pressing the YES button allows you to name and save your sound. Pressing the NO button will allow you to retake your sample. You will also have the opportunity to assign it to an existing or new Keyboard Setup. If you choose to assign your sound now (if you have other recording to do you can always assign it later) you will be taken to ASSIGN SOUND TO KBD (DIG 10).

*Remember to save your sampled via QLS. Data in the digitzer memory banks is lost when the 250 powers down.*

Anytime you create a Keyboard with more than one sample in it you will have to make some decisions about the ranges to which these samples are assigned. If don't want to make those decisions (or if you just want to save a little time) the 250 will set up the ranges for you. Once you have assigned your samples to their roots, the 250 will calculate the split points automatically so that each sample covers a range which utilizes its optimum playback rates.

## NOTE

Making your own samples can be a very rewarding process. Although digital recording is a fairly complex endeavor, sampling on the 250 is not. The difficulty comes when you begin to evaluate the samples you are taking. Deciding whether a sample is distorted, too soft, or otherwise unusable is more than just setting the right record level and looking at a bunch of numbers. When you're trying to decide if a sample is good enough close your eyes and use your ears. Working with advanced digital recording equipment like the 250 has a tendency to make techno-junkies out of all of us. Once we begin to understand clipping, compression, and a few other whiz-bang concepts we start listening with our eyes—adding up numbers and making technical evaluations based on what see in the display instead of making emotional evaluations based on what we hear in the speakers.

## TUNE SOUND (DIG 2)

Pressing the SELECT button when this item is in the display causes the 250 to prompt you for the Soundfile you want to tune and the Keyboard you want to play it with. Use the arrow keys to scroll through the list of Soundfiles, press the SELECT button, scroll through the list of Keyboards, and press the SELECT button again.

*Joe Ierardi has a great tip for tuning your samples. See "Tips From the Master" at the end of this chapter.*

Actually, you can do a lot more here than just tune a Soundfile. In addition to changing the pitch of a sound, you can also change its volume, its decay and release rates, and filter tracking. Simply press the SELECT button to move from parameter to parameter. Play the sound on the 250 Keyboard as you adjust each parameter. This will tell you exactly how you are altering the sound.

## ADJUSTING THE VOLUME

The 250 will prompt you for the amount of the volume adjust (in dB). Use the VALUE slider to enter a number and play the sound as you adjust its volume. Volume adjustment is used most often to balance sounds with other sounds in a multi-sampled Keyboard setup. Try to keep your adjustments small. Raising the volume of a sound too high can affect its velocity sensitivity as well as its interaction with the resident 250 sounds.

## ADJUSTING THE PITCH

Here you can make adjustments to the pitch of a sound. The 250 will prompt you for the pitch step size. There are three options:

| | |
|---|---|
| NO PITCH ADJUST | 0 |
| CENTS | 1 |
| SEMITONES | 2 |

Choosing NO PITCH ADJUST cancels this operation and moves on to the next parameter. Choosing CENTS allows you to adjust the pitch of the sound microtonally in increments of 1/100th of a half step. Choosing SEMITONES allows you to adjust the pitch of the sound in half step increments. Use the VALUE slider to make your pitch adjustments and play the sound as you go so you can hear the changes.

Pitch adjustment is used primarily to tune the sounds of a multi-sampled Keyboard. Virtually any multi-sampled acoustic instruments you create will need some tuning.

The default selection is CENTS.

## ADJUSTING THE RELEASE RATE

Here you can set the release rate for your sound. A sound's release is the rate at which the sound decays when you lift your finger off the key. The 250 will prompt you to enter a release rate (in dB/sec). Use the VALUE slider to adjust the release rate and play the sound as you go so you can hear the changes.

## ADJUSTING THE DECAY RATE

If you are working on a sound that has been looped you can set the decay rate of the loop here. A sound's decay rate is the rate at which the volume of the looped section decays when you hold your finger on the key. The 250 will prompt you to enter a decay rate (in dB/sec). Use the VALUE slider to adjust the decay rate and play the sound as you go so you can hear the changes.

## ADJUSTING THE FILTER TRACKING

Here you can adjust the 250's anti-aliasing filters to track the sound up and down the Keyboard. Filter tracking can be either ON or OFF. When filter tracking is ON, the anti-aliasing tracks normally, raising the filter as the sound is transposed up, lowering it as the sound is transposed down. When filter tracking is OFF its response is inverted. The filter goes down when the sound is transposed up, up when the sound is transposed down.

For most sounds leave filter tracking ON. If you are producing a multi-sampled instrument, and you are using only a few samples to cover a large range (more than one sample every 7 or 8 halfsteps) turn filter tracking OFF. This will help smooth the transitions between notes that are transposed up and notes that are transposed down.

## TRIM SOUND (DIG 3)

Pressing the SELECT button when this item is in the display allows you to set the start and end points of your sound. (This is sometimes referred to as truncating but here it is called trimming). Trimming is the first thing you should do to your Soundfile after it is recorded. Trimming can be used to remove unwantedof silence at the beginning and end of a Soundfile. You should always trim a sound before looping it.

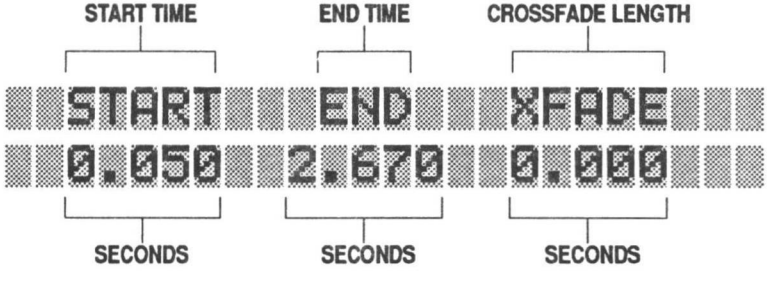
The 250 will prompt you for the Soundfile you want to trim and the Keyboard you want to play it with. Use the arrow keys to scroll through the list of Soundfiles, press the SELECT button, scroll through the list of Keyboards, and press the SELECT button again.

*As a rule, it is best to work with a copy of a sound any time you are performing operations which alter sample data.*

Use SLIDER #1 to set the start point and SLIDER #2 to set the end point. Play the sound as you go so you can hear the changes you are making. When you have trimmed the sound appropriately press the SELECT button. The 250 will ask if you want to replace the old, untrimmed sound with the new trimmed one. Pressing the YES button erases the old sound and puts the trimmed sound in its place. Pressing NO cancels the trimming operation. Be careful when trimming sounds. Trimming actually modifies sample data. Once a sound is trimmed any samples that were cut off are lost forever.

## LOOP SOUND (DIG 4)

Pressing the SELECT button when this item is in the display allows you to create a looped section within a sound. The 250 will prompt you for the Soundfile you want to loop and the Keyboard you want to play it with. Use the arrow keys to scroll through the list of Soundfiles, press the SELECT button, scroll through the list of Keyboards, and press the SELECT button again. The display will look something like this:



START marks the point in the Soundfile where the loop will begin. END marks the point in the Soundfile where the loop will end. XFADE is the length of the crossfade. A crossfade modifies the sample data at each end of the loop to make a smoother transition between the START and END points. To set the START point use SLIDER #1. To set the END point use SLIDER #2. To set the XFADE use SLIDER #3.

*Using the sliders makes looping easy.*

In an unlooped sound the 250 plays straight through the Soundfile from one end to the other. In a looped sound the 250 plays from the beginning of the Soundfile up to the loop end point and then immediately returns to the loop start point. It then repeats this process as long as the note is turned on. If you were to arbitrarily pick two points in a Soundfile and use them as the start and end points of a loop chances are you would hear a loud click every time the loop repeated. This would be caused by a discontinuity in the waveform created by the difference in amplitude of the sample at the end point and the sample at the start point. To get a smooth loop then, the amplitude of the START and END points must match. Also the waveform must be moving in the same direction at the START and END points. If the waveform is moving positive to negative at the START point and negative to positive at the END POINT you will end up creating a waveform with a sharp cusp in it that will also cause a click.

Each time you set a new START or END POINT re-strike the key to which your sample is assigned and listen to the loop. If you need more control than the sliders provide you can step through the zero-crossings one at a time by pressing the LEVEL button. When the LEVEL button is on, SLIDER FUNCTION SELECT button #1 can be used to move the START point backward to the next zero-crossing. The ALPHA button can be used to move the START point ahead to the next zero-crossing. SLIDER FUNCTION SELECT button #2 can be used to move the END point backward to the next zero-crossing. The VALUE button can be used to move the END point ahead to the next zero-crossing. Whether you use the sliders or the buttons the 250 will always do a pretty good job of finding the nearest appropriate place for a loop.

*Crossfade looping is really cool, but use just a little of it at a time.*

When the loop is set, if it isn't smooth enough, use the XFADE to help smooth things out. Crossfade is a process in which the 250 takes a look at the samples around the START and END points and alters them to make the transition between the END and the START points smoother. Be careful when using XFADE. Crossfade looping permanently alters sample data.

## A BASIC APPROACH TO LOOPING

Finding a usable loop can seem like an endless process. Here's a basic approach to looping that won't take too much time and will usually give you a usable loop on any sustaining Instrument sound of at least 1.5 seconds in length:

**STEP 1.** Set the START point at about 0.3 seconds. It is virtually impossible to get a good loop if the START point is placed any time during the attack portion of the sound. At 0.3 seconds most Instruments are into the sustaining portion of their sound.

**STEP 2.** Set the END point as far back as it will go. Move SLIDER #2 all the way to the top. If the END point does not show the end of the Soundfile that is because a loop on the 250 can only contain 64,000 samples. If there are more than 64,000 samples (about 2.5 seconds at 25,000 Hz) between the START point and the end of the Soundfile, the END point of the loop will be placed at the nearest zero-crossing that is within 64,000 samples of the START point. If you do find yourself at the end of the Soundfile move the END point up about 2 tenths of a second.

*In "Tips From the Master", Joe Ierardi also describes a step-by-step approach to looping.*

**STEP 3.** Play the sound. You may already have found suitable loop points.

**STEP 4.** Press the LEVEL button to start stepping through the zero-crossings.

**STEP 5.** Press SLIDER FUNCTION SELECT button #2 to step to the next zero-crossing and play a note on the Keyboard to listen to the loop with a new END point.

**STEP 6.** Repeat Step #5 a few times. If you can't find a suitable loop there probably aren't any in this area of the waveform.

**STEP 7.** Pick a new point in the waveform by pressing the LEVEL button and moving SLIDER #2 down far enough to move the END point about 2 tenths of a second closer to the START point.

**STEP 8.** Repeat Steps 4-7 until the END point is within a half second of the START point. Then, move the START point forward about two

tenths of a second, move the END point back to the end of the Soundfile, and repeat the whole process in the other direction.

**STEP 9.** When you've found the best loop use SLIDER #3 to create a very small crossfade. This will help to smooth things out even more.

Some sounds are virtually impossible to loop because they are so complex. This approach takes you quickly and methodically through each part of the waveform. If you can't find a usable loop this way take the best loop points you have and use a huge crossfade. A long enough crossfade should be able to smooth out even the roughest loop although it will alter the sound of your Soundfile.

### KBD EDIT OPTIONS (DIG 5)

Pressing the SELECT button when this item is in the display takes you to ASSIGN SOUND TO KBD (DIG 10).

### DELETE OPTIONS (DIG 6)

Pressing the SELECT button when this item is in the display takes you to DELETE SOUND (DIG 13).

### DUPLICATE OPTIONS (DIG 7)

Pressing the SELECT button when this item is in the display takes you to DUPLICATE SOUND (DIG 18).

### DISPLAY OPTIONS (DIG 8)

Pressing the SELECT button when this item is in the display takes you to SHOW FREE SAMPLES (DIG 20).

### MISCELLANEOUS OPTIONS (DIG 9)

Pressing the SELECT button when this item is in the display takes you to REVERSE SOUND (DIG 23).

## ASSIGN SOUND TO KBD (DIG 10)

Pressing the SELECT button when this item is in the display allows you to assign a Soundfile to a range of notes (a region) on a 250 Keyboard Setup.

Creating a multi-sampled instrument involves the process of assigning several Soundfiles to ranges on the same Keyboard. If sampling memory were infinite it would be possible to assign a separate sample to every note of an instrument's range, but because memory is limited only a few samples are taken throughout an instrument's range. These samples, called roots, are then assigned to the Keyboard at the pitches at which they were recorded. The 250 plays the missing pitches in between by transposing up and down from the root samples. Each root occupies a small region on the Keyboard defined by high and low key assignments for a Soundfile. To play back the sound, the 250 figures out which region the note is in, checks to see where the root sample is, and transposes up or down as necessary to play the correct pitch. The point at which one region ends and another begins is called a split point.

Remember, you can set the split points by defining the high and low keys for any region but the 250 will do it for you automatically if you want it to.

## ASSIGNING A SOUNDFILE

When you assign a Soundfile to a Keyboard the 250 will first prompt you to select a Soundfile. It will then ask if you want to add this Soundfile to an existing Keyboard. Pressing the YES button allows you to choose an existing Keyboard. Pressing the NO button automatically creates a new Keyboard and allows you to name it. You can then assign the Soundfile to the Keyboard by striking any key.

If you are assigning a Soundfile to an existing Keyboard you'll be given the chance to select one from the list of digitizer Keyboards. Choosing a Keyboard allows you to review it before making the assignment. Play the Keyboard to familiarize yourself with the samples already assigned. When you are ready to assign your Soundfile press the SELECT button.

At this point the 250 will prompt you with the message: **Assign to multiple hardness levels (Y/N)?** Pressing the YES button allows you to create what is called a dual-hardness Keyboard. Pressing the NO button will allow you to create a regular Keyboard.

## REGULAR KEYBOARDS

Regular Keyboards created in the digitizer have only one layer. If you decide not to create a dual-hardness Keyboard you will be asked to assign your Soundfile to the Keyboard by striking a key. After striking a key you'll be prompted with this message: **Automatic split points (YES)?** Because you are assigning a Soundfile to an existing Keyboard (a Keyboard with at least one Soundfile in it already) the 250 needs to know the region that you want each Soundfile to cover. Using automatic split points means the 250 will define the regions for you by creating a split point that is at the optimum point between adjacent roots. If you don't want to use the automatic split points you can create your own. Pressing the NO button allows you to strike the low and high keys for the region you want your Soundfile assinged to. A region can be as small as a single note or as large as the entire Keyboard but there are limits to how far a single Soundfile can be transposed. All Soundfiles can be transposed down 5 octaves. How far a sound can be transposed up depends on the rate at which it was sampled. Here's a table showing the 250's sampling rates and their maximum upward transpositions:

| SAMPLING RATE RATE | MAXIMUM UPWARD TRANSPOSITION |
|---|---|
| 50,000 Hz | 2 HALF STEPS |
| 41,667 Hz | 5 HALF STEPS |
| 35,714 Hz | 8 HALF STEPS |
| 31,250 Hz | 10 HALF STEPS |
| 25,000 Hz | 14 HALF STEPS |
| 22,500 Hz | 16 HALF STEPS |
| 20,000 Hz | 18 HALF STEPS |
| 17,500 Hz | 20 HALF STEPS |
| 15,000 Hz | 23 HALF STEPS |
| 12,500 Hz | 26 HALF STEPS |
| 10,000 Hz | 30 HALF STEPS |
| 7,500 Hz | 35 HALF STEPS |

| | |
|---|---|
| 6,250 Hz | 38 HALF STEPS |
| 5,000 Hz | 42 HALF STEPS |

## DUAL-HARDNESS KEYBOARDS

A dual-hardness Keyboard has two layers, one that responds to soft key strikes and one that responds to hard key strikes. When adding a sound to an existing Keyboard to create a dual-hardness Keyboard you'll be asked if the Soundfile you are assigning is to be assigned to the soft layer or the hard layer. The 250 will prompt you for the appropriate layer with this message: **Hard=YES, Soft=NO**. Pressing the YES button tells the 250 you want to assign the current Soundfile to the Hard layer. Pressing the NO button tells the 250 you want to assign the current Soundfile to the soft layer.

*Try DUAL HARDNES TENOR in Sound Block D to get an idea of what you can do with dual-hardness Keyboards.*

Assigning the Soundfile can be a little tricky. Because you are creating a Keyboard with two layers the current Soundfile must be assigned to a note which has another Soundfile assigned to it. If you attempt to assign the current Soundfile to an unassigned note the 250 will respond with the message: **Key not assigned**. The 250 will not let you assign your Soundfile until you strike a note to which another Soundfile is assigned. If you can't find one the only way to get out is to press the PLAY button and strike a key on the Keyboard. You'll be taken back to ASSIGN SOUND TO KBD (DIG 10).

## REMOVE SOUND FROM KBD (DIG 11)

Pressing the SELECT button when this item is in the display allows you to remove a Soundfile from a Keyboard. The 250 will prompt you for the Soundfile you want to remove and the Keyboard you want to remove it from. Use the arrow keys to scroll through the list of Soundfiles, press the SELECT button, scroll through the list of Keyboards, and press the SELECT button again. The 250 will then prompt you with this message: **Extend the range of adjacent sounds (YES)?** Pressing the YES button will cause the 250 to extend the ranges of adjacent root samples to take up the space of the removed Soundfile. The new ranges are determined exactly as they are when the 250 determines automatic split points. Pressing the NO button leaves empty space (no sample assigned) on the Keyboard from which the sound is removed. The exception to this occurs when you remove

a sound from one layer of a dual hardness Keyboard. In that case, the sound beneath the sound being removed is "moved up" so that it exists in both the hard and soft layers simultaneously.

## SET KBD CROSSOVER LEVEL (DIG 12)

*Remember, the 250 has twice the velocity resolution of MIDI.*

Pressing the SELECT button when this item is in the display allows you to set the response of dual-hardness Keyboards. The 250 will prompt you for the Keyboard you want to work on. Use the arrow keys to scroll through the list of Keyboards. When you've selected a dual-hardness Keyboard the 250 will prompt you for the value of the KBD crossover level. Use the VALUE slider to enter a number from 0 to 255. This number corresponds to the velocity value necessary to trigger the sound in the hard layer. The higher the number, the harder you will have to play to trigger the sound assigned to the hard layer.

## DELETE SOUND (DIG 13)

Pressing the SELECT button when this item is in the display allows you to delete a Soundfile from the digitizer memory. The 250 will prompt you for the Soundfile to be removed. Use the arrow keys to scroll through the list of Soundfiles. When a Soundfile is removed from memory it is also removed from all Keyboards to which it has been assigned. In order to remove the sound from a Keyboard the 250 will ask if you want to extend the range of adjacent samples exactly as it did in REMOVE SF FROM KBD (DIG 11) above.

## DELETE KBD (DIG 14)

Pressing the SELECT button when this item is in the display allows you to delete a digitizer Keyboard. The 250 will prompt you for the Keyboard you want to delete. Use the arrow keys to scroll through the list of digitizer Keyboards. Deleting a Keyboard has no effect on the Soundfiles that were assigned to it. They exist unchanged in the Digitizer memory and can be assigned to other Keyboards as usual.

## UNLOOP SOUND (DIG 15)

Pressing the SELECT button when this item is in the display allows you to remove a loop from a sound. The 250 will prompt you for the Soundfile from which you want to remove the loop. Use the arrow keys to scroll through the list of digitized Soundfiles. Unlooping a sound will not restore any portion of the sound beyond the end point of the loop. Therefore, you should always duplicate your samples before looping, if you want to preserve their original condition.

## INITIALIZE BANK (DIG 16)

Pressing the SELECT button when this item is in the display allows you to initialize and erase a digitizer bank. If you have SUPERAM the 250 will prompt you for the number of the bank you want to initialize. Use the left and right arrow keys to scroll through the list of digitizer banks. Initializing a bank erases its contents. All Soundfiles and Keyboards will be permanently removed. Because of this, if the bank you are initializing contains any data the 250 will prompt you for additional confirmation of the operation.

## REMOVE SOUND FROM KBD (DIG 17)

This item is identical to DIG 11. See that item for a complete discussion of this option.

## DUPLICATE SOUND (DIG 18)

*It is always a good idea to duplicate a sound before looping or trimming.*

Pressing the SELECT button when this item is in the display allows you to make an exact copy of any existing digitizer sound. The 250 will prompt you for the Soundfile you want to duplicate. Use the left and right arrow keys to scroll through the list of digitizer Soundfiles. Pressing the SELECT button will start the duplication process. You will then be asked to enter the new name for the duplicated Soundfile. Use the ALPHA slider (SLIDER #1) to enter the name. It is always a good idea, if you have enough memory, to duplicate a sound before performing any operation on it that alters sample data, such as trimming or looping.

## DUPLICATE KEYBOARD (DIG 19)

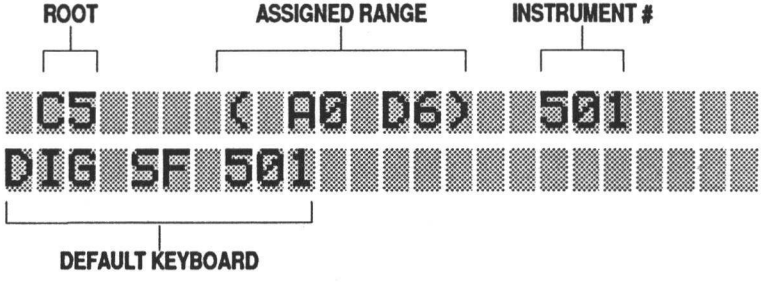
Pressing the SELECT button when this item is in the display allows you to make an exact copy of any existing digitizer Keyboard. The 250 will prompt you for the Keyboard you want to duplicate. Use the left and right arrow keys to scroll through the list of digitizer Keyboards. Pressing the SELECT button will start the duplication process. You will then be asked to enter the new name for the duplicated Keyboard. Use the ALPHA slider to enter the name.

## SHOW FREE SAMPLES (DIG 20)

Pressing the SELECT button when this item is in the display allows you to see how much memory is left in each bank of the digitizer. If you have SUPERAM the 250 will then prompt you for the number of the digitizer bank you want to see. Use the left and right arrow keys to scroll through the list of digitizer banks. Pressing the SELECT button then displays the number of samples available and the number of Soundfiles and Keyboards that have been created.

## SHOW ROOTS (DIG 21)

Pressing the SELECT button when this item is in the display allows you to see the assignments of samples (roots) on any digitizer Keyboard. The 250 will prompt you for the Keyboard you want to see. Use the arrow keys to scroll through the list of digitzer Keyboards. Pressing the SELECT button displays the first root, its range, and the name of Soundfile assigned.



Use the left and right arrow keys to see the assignments of other roots on the Keyboard.

### SHOW SOUNDFILE INFO (DIG 22)

Pressing the SELECT button when this item is in the display allows you to view the sampling rate and length of any digitizer Soundfile. The 250 will prompt you for the Soundfile you want to view. Use the arrow keys to scroll through the list of digitized Soundfiles. Pressing the SELECT button displays the number of samples the Soundfile contains, the rate at which it was sampled, the length of the sample in seconds and whether the sound has been looped (an "L" will appear in the last character of the display) or compressed (a "C" will appear in the last character of the display).

### REVERSE SOUND (DIG 23)

Pressing the SELECT button when this item is in the display allows you to reverse a digitized Soundfile so that when it plays back it comes out backwards. The 250 will prompt you for the Soundfile you want to reverse. Use the arrow keys to scroll through the lists of digitized Soundfiles. Pressing the SELECT button reverses the sound. Looped sounds cannot be reversed until the loop is removed.

### RENAME OBJECT (DIG 24)

Pressing the SELECT button when this item is in the display allows you to rename any existing digitizer Keyboard or Soundfile. The 250 will display the message: **Rename SF or KBD? YES=SF, NO=KBD**. Pressing the YES button will allow you to rename a Soundfile. Pressing the NO button will allow you to rename a Keyboard. In either case you'll be given a chance to select the Keyboard or Soundfile you want to rename. Then you can rename it using the ALPHA slider.

## GETTING AROUND WITH THE FRONT PANEL BUTTONS

In several of the editors it is possible to go directly to a particular menu

item by pressing the appropriate front panel button. The button assignments for the digitizer are listed below. Learning the buttons and their assignments in each of the editors can help you to move around more efficiently.

**DIGITIZER BUTTON ASSIGNMENTS**

| Pressing This Button | Takes You to This Item |
|---|---|
| ALPHA | RENAME OBJECT (DIG 24) |
| VALUE | SHOW SOUND FILE INFO? (DIG 22) |
| DETUNE | TUNE SOUND? (DIG 2) |
| CONTINUE | ASSIGN SOUND TO KBD? (DIG 10) |
| LOOP | LOOP SOUND? (DIG 4) |
| TEMPO UP | SHOW ROOTS? (DIG 21) |
| TEMPO DOWN | REVERSE SOUND? (DIG 23) |
| EDIT | SET KBD CROSSOVER LEVEL? (DIG 12) |
| SEARCH | SHOW FREE SAMPLES? (DIG 20) |
| SAVE | RECORD SOUND? (DIG 1) |
| ERASE | DELETE SOUND? (DIG 13) |
| SET POINTER | TRIM SOUND? (DIG 3) |
| INSERT | DELETE KBD? (DIG 14) |
| LIST | INITIALIZE BANK? (DIG 16) |
| MIDI | REMOVE SOUND FROM KBD? (DIG 11) |
| SYNC | UNLOOP SOUND? (DIG 15) |
| READ | DUPLICATE SOUND? (DIG 18) |
| SEND | DUPLICATE KBD? (DIG 19) |

# *Tips From the Master*

## *Sampling Secrets*

*The following section was written by Kurzweil engineer Joe Ierardi. Joe is the creator of many of the Kurzweil ROM sounds and is, without doubt, a true master of sampling with the 250. He has generously offered to share with us his experiences and insights on sampling. Here is his advice.*

In general, if you are at all serious about sampling, your best bet is to

*"Tips From the Master", continued...*

go to tape with your original recordings before sampling them onto the 250. Preferably you should use some digital format. This is how all sampling is done here at the factory. You will find that this will save loads of time in getting good levels and good takes. In addition you will also have a reliable "backup" for your work.

Don't get me wrong, there is nothing wrong with going directly into the 250 from the original source. In a pinch this will work fine. In my experience, however, there is nothing more frustrating than having your player give you an excellent take only to have to scrap it because you got a poor level on the 250. If you initially go to tape with your sounds, you will always have those great takes and will be able, at your leisure, to get an optimum level when sampling onto the 250.

## CHOOSING A SAMPLE MODE

Most samplers have only one way of sampling, but the 250 offers several distinctly different sampling modes, each appropriate to a specific recording situation.

### Quick Take

The quick and easy (or perhaps quick and dirty) mode. This is fine if you are not too concerned about getting the ultimate sound quality, and you don't mind the sample being brighter than the source. In fact, one obvious application of Quick Take (other than the fact that you may be in a terrific hurry) is making the sample sound brighter than the original source. Another possible application is if you are doing a lot of vocal (speech) samples where high fidelity is not an issue.

### De-emphasis

De–emphasis provides significantly better sound quality than Quick Take. It is most often used for non-decaying sounds (horns, strings, etc...), although it performs admirably for slowly decaying sounds if you haven't got the time to wait for the compression modes.

### Compression Modes

These modes will give you the best sound quality for decaying sounds. We have generally found that Fast Decay works best in most cases, even for sounds we might normally consider to have normal or slower decays i.e., pianos, cymbals. We have also found compression useful for certain types of non-decaying sounds i.e., sounds with sforzando

*"Tips From the Master", continued...*

attacks followed by sustaining sections.

Compression will make you wait a bit, but the result is superior 250 sound quality.

## CHOOSING A SAMPLING RATE

One question I have been frequently asked is: why not just select 50KHz all the time? Although it is true that a 50KHz sampling rate will insure that you have captured all audible frequencies, it is very often not the best choice for your sampling rate for the following reasons:

### Memory

Memory is always a consideration when sampling. Choosing lower sampling rates will yield considerable savings here.

### Band Width and Sound Quality

Many sounds simply do not have strong high frequency components. Not only will you be wasting samples, but you may also find that you get poorer sound quality when you oversample. This can happen because the sound that you are sampling does not have any high frequencies to mask the inherent background noise. Thus, your samples may seem noisier when you use more bandwidth than is necessary.

### Your Hearing

How much ear splitting rock and roll have you listened to anyway? Are you sure you can hear anything above16K anymore?

## GUIDELINES

Here are some simple guidelines for choosing a bandwidth based on our experience.

### Sounds Which Require Full 20K Bandwidth

Cymbals and Bells.

### Sounds Which Can Use 14-16K Bandwidth

Snares, Horns, Acoustic Guitars.

*"Tips From the Master", continued...*

I should like to point out that a 12K bandwidth for many of these sounds is quite acceptable if you need to conserve memory.

**Getting Away With Murder**
Electric Guitars (miked from amps) do quite well with a 7K bandwidth. Keep in mind that the Frequency Response of most guitar amplifiers is often lower than this.

**Voice**
10K to 12K has proven to be quite adequate.

Remember, these are just some simple guidelines. Choosing the proper sample rate requires much experimentation, practice, and experience in knowing when to trade off higher bandwidth for the luxury of taking more or longer samples. Fortunately for you, the 250 allows you to choose from a large number of different sample rates (14 to be exact) unlike other samplers that restrict you to a few or even just one sample rate.

## TIPS ON USING RECORDING TRIGGERS

If you want to use the trigger option, it is strongly recommended that you use some pre-trigger so that you do not miss any of the initial attack. The attack is the most important part of the sound in sampling and you always want to preserve as much of the attack as you can. Thus, for sounds with rather sharp attack transients (like drums), it is suggested that you use the maximum amount of pretrigger. Remember, you can always trim off any excess later.

## SETTING A LEVEL

Since the compression modes set their own levels, the following comments apply exclusively to the Quick Take and De–emphasis modes.

Although the manual is correct in saying that lower maximum levels produce acceptable takes, in practice I never use a take with a maximum level value lower than 480. Preferably, I like to see values be-

*"Tips From the Master", continued...*

tween 490 and 511. I should also like to point out that a maximum of 1 or 2 clips is an excellent sample level. In fact, usually up to 20 clips is fine. Bear in mind that the number of clips refers to the actual number of samples that get clipped during recording. For example, if you have 6 clips for a 3-second-long sample at 50KHz, this means that only 6 of the 150,000 samples taken exceeded the maximum gain. This is not going to result in any audible clicks, pops, or distortion in your sound. It is an excellent level.

## ONE FINAL TIP WITH REGARD TO SETTING LEVELS

If your source level input is constant (from a tape or CD), and the 250 registers many clips, you may find you only have to back off a little on the 250 gain to drastically reduce the number of clips. This is to be expected.

## TRIMMING

The general idea here is that you want to trim close enough to the actual attack so that the sound "speaks" or is playable, while preserving the original attack. A sample whose attack has been trimmed off is a sample that has lost some of its character and realism. The best way to insure that you have trimmed as close to the attack as possible is by using the transpose buttons when you are trimming.

After you have selected the trim option, trim the sample up to what you think sounds like the beginning of the sound, then press the TRANSPOSE DOWN button once. You should now hear the sample pitch shifted down one octave. Because you are now playing the samples back at 1/2 the normal speed, you should begin to hear more clearly how close to the real attack you are. Press the TRANSPOSE DOWN button again. You should now hear the sample stretched down 2 octaves. The samples are now being played back at 1/4 speed so you should really be able to zoom in on that real attack start point. As you can see this is a much more accurate way of trimming. You can continue to use the TRANSPOSE buttons to check out the trim at normal and slow speeds. In fact you can transpose the sample as much as 5 octaves down, but in practice I find 2 or 3 octaves down to be sufficient.

*"Tips From the Master", continued...*

## TRIMMING THE ENDS OF SAMPLES

For sounds which you will not be looping (such as percussion), you will want to trim any excess sound off the end. A very efficient way to do this is to reverse the sample and then trim the end with the start slider. You will find this to be most effective and valuable since the 250 compacts its memory to give you more sample time for the samples that you trim off. One word of caution when you reverse the sound to trim the ends: be sure that the end slider is all the way to the top if you've already trimmed the attack before you select the new trim and re-reverse the sample. Otherwise, you may inadvertantly trim more of your real attack.

## TUNING

Tuning samples is pretty straightforward. Here are a few hints to make the task a little easier.

### Volume Adjustments

It is very helpful to disable the 250's sensitivity to dynamics (menu item #6 in the Function Editor) when doing volume adjustments in order to insure that your sampled keyboards will be as uniform as possible in volume.

### Pitch Adjustments

Perhaps the best way to do this is to use a fairly accurate tuner, but in lieu of that you may just prefer to attempt to tune your samples to the 250 piano sound. This can be easily accomplished by creating a layered Keyboard Setup of the KURZWEIL GRAND PIANO and your digitizer Keyboard. Save this and select it when you go to tune your samples. You will then be able to adjust the pitch relative to the piano and hear them simultaneously.

NOTE: You must be sure that the layered Keyboard is the current Keyboard in Play Mode. Also be sure to select it when prompted by the Tune option.

## SETTING FILTER TRACKING

This is useful for smoothing out transitions from sample to sample. For

*Tips From the Master", continued...*

example, if a sample is a bit brighter sounding than its higher adjacent sample, then setting the filter tracking to OFF (antitracking) will prevent the sample from getting brighter as it is transposed up, thereby making a smoother transition to the higher, duller, neighboring sample.

## LOOPING

First, a word to the wise: save a copy of the unlooped files. This way you will always have a version to re-loop or to re-use for several different loop attempts.

Second, looping is not easy, so don't get too discouraged if you find your initial attempts less than satisfying. It requires great patience and lots of practice to get first-rate loops. If you use lower sample rates and are not too concerned about conserving memory, you may choose not to loop some sounds and just take longer samples. In general, however, loops are essential to most sustaining and slowly decaying sounds.

## STATIC LOOPS

Sometimes referred to as "1 cycle" loops, these are very short loops, .01 to .03 seconds long, which contain some small number of cycles of the waveform you are looping. These loops work particularly well with harmonic solo instruments sampled without vibrato. Solo trumpet, sax, guitar, electric organ and solo clarinet are types of sounds that can use static loops. They are pretty easy to do and can also save you lots of memory.

## HOW TO DO A STATIC LOOP

In general when looping any file you should begin by setting the crossfade slider (SLIDER #3) to zero while trying out different loop points. Not only will this help you to find better loops, but it will also save you time by enabling the 250 to more quickly calculate new loop points.

Having said that much, select your Soundfile to loop and move the

*"Tips From the Master", continued...*

crossfade slider to zero. Next, move the start slider (SLIDER #1) to about .5 seconds. This done, move the end slider to about .53 seconds (anywhere reasonably close to this will do). Chances are this may sound pretty strange. At this point we will access a very hip feature of the loop option by pushing the "level" button. This activates a mode in which the 250 will automatically find zero crossings for you. That is, the 250 will find points at which the waveform you are looping cycles through zero. When activated, the START and END sliders no longer move the start and end times. Instead you use the two buttons just above each of the sliders to step forward and back through the zero crossings. Start by pushing the top button above SLIDER #1 (ALPHA) a couple of times. You should see the START time of the loop step ahead. Push the lower button above slider 2 (below the VALUE button) a couple of times. You should see the loop END time step back. Next, play the sound as you step. The sound of the loop should change. You may notice that the loop seems to change pitch. Continue to step until the loop sounds like the correct pitch. This is a static loop.

Continue to experiment stepping the START and END times back and forth. There will be several places you will find acceptable loops depending on how many cycles of the waveform you have captured. When you have got something you like, try adding some crossfade. It may not make a lot of difference with a short static loop, but I usually find that using crossfade in a static loop makes it slightly less buzzy.

## ANOTHER HELPFUL HINT

Once you have found a pretty good static loop, try stepping *both* start and end times together either backward or forward (in any case, in the same direction). As long as the *size* of the loop does not change you should continue to find good loops and, perchance, an even better one.

NOTE: The .5 second start time was purely arbitrary and depending on how frugal or how luxurious you want to be with your samples you should be able to find static loops earlier or later in the sample.

## LONG LOOPS

As I said previously, static loops will not work for all sounds. Ensemble

*"Tips From the Master", continued...*

sounds like chorus strings or choir have more complex waveforms, and static loops do not work at all on these. Even some solo instrument sounds such as the flute or solo human voice will not take static loops because of the breath noise involved. Other types of sounds which do not sound good with static loops are instruments sampled with vibrato.

All of the types of sounds mentioned above require longer loops. These loops are, in general, more difficult to do. They require more patience to get them to sound good, and in some cases it may seem like a really good unobtrusive loop is not possible.

## HOW TO DO LONG LOOPS

After selecting the soundfile once again move the crossfade slider to zero. The rule of thumb here is to find the best loop you can using no crossfade and then add just a little crossfade to help smooth it out more.

How do you find the best loop? Well, there are no secrets. It's more or less trial and error until you start to develop a feel for what might work best, but the following suggestions may help.

Before trying any loops, move the END slider to zero as well. The display will say "No Loop" on the right side and show the START time on the left. You can now preview the unlooped sound by moving the start slider up and down. You want to try and locate a portion of the sound that is fairly smooth—uniform in amplitude and constant in pitch. It does not necessarily need to be a large portion of sound:

.3-.5 seconds is good for solo horn sounds
.5-.7 seconds is typical for a breathy flute
.8-1.3 seconds may be needed for ensemble strings, voices or horns

The loop start time should occur after the attack has had a chance to settle down. This is generally around .3 seconds.

Once you've got a rough idea of the section of sound you might be able to loop best, experiment by moving both the start and end sliders around that area. The loop may "click" at this point but don't be too concerned with that for now. Just try to find something that does not

*"Tips From the Master", continued...*

seem to *throb* or pulse too badly. When you have found something you like (or when you have simply reached the end of your patience), use the LEVEL button to go into the zero crossing mode. By stepping to new values around this area you may find some points which do not "click" as much. When you find something that sounds as good as you think it will get (there may still be a faintly audible click), add a bit of crossfade (25 msec or so). This should get rid of any glitch. If you still hear some, try a little more crossfade. Too much crossfade, however, may result in a sort of flanging effect at the loop point.

If your loop seems to click very badly it may be due to some slight pitch fluctuation which is preventing the waveform from lining up with itself. There is not too much you can do about this except to try and loop a different section of the sound. Good Luck!

## HOW TO DO 50K COMPRESSION

As you may have noticed, the Compression modes only work with sample rates up to 31K. However, it is possible to get around this. If your tape recorder has 1/2 speed or if you are sampling from another sampler or drum machine and can tune the sample down an octave, try sampling the sound into the 250 at 1/2 speed (or 1 octave lower) at the 25K compression rate. Then once you have it on the 250, you can tune it back up an octave giving you, in effect, a 50K playback rate and a 20K bandwidth *with Compression!*

## A FEW WORDS ABOUT MULTI-SAMPLING

The number of individual samples you will need and the interval between these samples varies between different instrument groups and also depends on how much memory you want to use. The following list contains some recommendations based on my experience (which is borne largely out of trial and error and plenty of practice). Again, though there are no hard and fast rules for any of this, you should nonetheless find this helpful and hopefully time saving.

### Guidelines For Multi-Sampling

**Electronic Keyboards** (organs, e. pianos, etc.) **and Synths** seem to be among the easiest to sample in terms of how much you can stretch individual samples. Sampling these types of sounds can be very

*'Tips From the Master", continued...*

convincingly done in octaves.

**Guitars**, both acoustic and electric work quite well sampled in fourths. If you need to conserve memory, you can probably get away with fifths as well.

**Acoustic Piano** is a rather unusual case. Some ranges seem to demand to be sampled in smaller intervals whereas other ranges seem to transpose a little better. It really depends on the actual instrument you are using as well. At any rate, the piano has a much larger range (7+ octaves) than other instruments so in the interests of memory I would recommend sampling in fifths.

**Solo Strings** can be done in fifths, but fourths or even major thirds are preferable.

**Woodwinds** such as flute, clarinet or oboe all sound pretty good sampled in fourths. The exception in this family is the bassoon, which changes pretty rapidly throughout its range. Major thirds are recommended, if you can spare the memory.

**Saxes** are probably the most stubborn of all instruments to sample. They seem to resist being sampled in anything but minor or major thirds. Fortunately, they have small ranges.

# *Appendix A*

# *For Pre-Version-Six 250 Owners Only*

*Appendix A*

# *For Pre-Version-Six 250 Owners Only*

## INTRODUCTION

This appendix is for pre-version 6.0 250 owners only. What will be covered very briefly are the differences between version 4.1 and version 6.0. Therefore, the version 4.2 update and the version 5.0 update will be covered briefly as well as a list of the new features added in version 6.0.

*Ver. 4.2 Updates*

## IGNORE "ALL NOTES OFF" MESSAGES

Version 4.2 adds a new feature to the Kurzweil 250, the ability to ignore MIDI "ALL NOTES OFF" commands. This feature has been added at the request of many K250 and 250 RMX owners who use MIDI keyboard controllers. The reason is that some controllers and MIDI devices (most notably Roland) send out "ALL NOTES OFF" whenever the MIDI data stream stops, which has the effect of killing any sustained notes. This quirk previously made it impractical to use one of these controllers with the 250. Now the 250 can be configured to ignore "ALL NOTES OFF" events.

There is a new menu item in the MIDI Editor under RECEIVE OPTIONS. It is MIDI 10 "RECEIVE ALL NOTES OFF?" The default for this item after a hard reset is "ON," meaning that the K250 will respond to MIDI "ALL NOTES OFF." For most situations, this is the correct setting. However, if your 250 will be receiving data from one of the above

mentioned MIDI devices, switch this item to "OFF." This means that the K250 will ignore these events, allowing you to play with sustain. To accommodate this new feature, MIDI Editor numbers 10 and above have been increased by one (RECEIVE CHANNELS, which was MIDI 10, becomes MIDI 11, and so on).

**LEVEL**

## THE PANIC BUTTON

The LEVEL button (SPLIT KEYBOARD on older units), which acts as a "PANIC BUTTON" while in PLAY Mode, no longer resets the master tuning of the K250.

## VIBRATO DEPTH MULTIPLIER

The vibrato depth multiplier has been changed so that a value of 1 implies a maximum vibrato depth of a quarter-tone; previously a vibrato depth multiplier of 1 implied a maximum vibrato depth of a semitone. This change allows one to more easily achieve subtle vibrato effects.

## PUNCH-IN RECORDING OVER MIDI

The sequencer no longer records the controller event that signals the punch.

## RECORDING PITCH BEND OVER MIDI

Now the sequencer correctly records pitch bend greater than 2 semitones from MIDI.

## SEQUENCER TRACK MIDI MODES BUG

Sequencer tracks set to "K250 ONLY, NO MIDI" no longer transmit sustain information over MIDI.

### CHANNEL VOLUME, MIDI VOLUME AND SEQUENCE VOLUME

These have been improved so that they now achieve maximum attenuation.

### EXTERNAL PEDAL 1

This now correctly defaults to controlling channel volume.

### MIDI VIBRATO RATE MULTIPLIER DEFAULT

The default VIBRATO RATE MULTIPLIER for MIDI channels 1-16 is now 200 instead of 20.

### RECORDING VIBRATO AND TREMOLO IN SEQUENCES

The sequencer will now record vibrato and tremolo reliably.

### PRETRIGGER RECORDING

The digitizer will now correctly record sounds when you use pretrigger recording.

## *Ver. 5.0 Updates*

### SEPARATE OUTS

Version 5.0 is the new Separate Outputs software for the K250, which allows you to take advantage of your new Separate Outputs hardware. It also contains the new features and bug fixes introduced in V4.2, as well as a few more.

### SEPARATE OUTPUTS EDITOR

A new editor has been added under FUNCTION [2]. Press F,2, SELECT and you will see the function editor "SEPARATE OUTPUTS." Press SELECT, and you will see: "ASSIGN CHANNELS?" which is the first

menu in the Separate Outputs editor. Pressing either the LEFT or RIGHT CURSOR keys will bring you to the other menu, "SHOW CHANNELS?"

## ASSIGN CHANNELS MENU

This menu allows you to specify the output assignment of each source channel. Source channels include sequence tracks, MIDI channels and the K250's own keyboard. For example, you can assign sequence track 1 to use outputs 1 & 2, sequence track 2 to use output 3, MIDI channel 1 to use outputs 4, 5 & 6, and the performance keyboard to use outputs 7-12. For RMX owners, Performance Keyboard equates to notes played from controller.

This menu also allows you to assign source channels to use Keyboard Regions, another new V5.0 feature. This works in conjunction with a new Keyboard Editor function, ASSIGN REGIONS TO OUTPUTS, which will be explained below.

When the display reads "ASSIGN CHANNELS?" (after pressing F, 2, SELECT, SELECT while in PLAY Mode), pressing SELECT again will bring you to "PERFORMANCE KEYBOARD?" At this point, the LEFT ARROW and RIGHT ARROW keys will step you through each of the available source channels. When you see the source channel displayed that you wish to edit, press SELECT. The display will change to "USES: KEYBOARD REGIONS." (The default setting for each source channel after a hard reset is keyboard regions.) Press the LEFT ARROW or RIGHT ARROW key once and the display will change to "USES: 1 2 3 4 5 6 7 8 9 A B C." These characters represent the 12 outputs (A, B and C correspond to outputs 10, 11 and 12 respectively). You will notice that the Mixboard buttons (the twelve buttons in the lower right corner of the front panel) are all lit. Pressing Mixboard buttons will turn outputs off and on. If you were to turn off all twelve outputs, the display would read "USES: NONE" and you would no longer hear any sound from that source channel. Press the LEFT ARROW or RIGHT ARROW key again and the display will return to "USES: KEYBOARD REGIONS." Pressing SELECT or the UP ARROW key brings you to the next source channel. Pressing PLAY takes you back to PLAY Mode.

To summarize, the ASSIGN CHANNELS menu allows you to specify for each source channel, either "USES: KEYBOARD REGIONS" or a

subset of the available outputs.

## SHOW CHANNELS MENU

This menu allows you to tum the Channel Activity Display on or off. You may have noticed that in PLAY Mode, the Mixboard LEDs flash on and off as you play notes. Each Mixboard LED corresponds to an output channel; when an output (channel) is playing, its LED will light, when the channel becomes idle, its LED will go out. This feature demonstrates which outputs you are using. If, for example, you set the performance keyboard to play through outputs 1-6, then in PLAY Mode you will see that only the top row of Mixboard LEDs will light as notes are played.

The bottom row will remain off unless some other source channel is playing through those outputs. This feature can be turned off if desired.

When the display reads "SHOW CHANNELS?" pressing SELECT will bring you to "SHOW CHANNELS: ON." At this point, the LEFT ARROW and RIGHT ARROW keys will toggle ON to OFF and vice versa. The default for this item on after a hard reset is ON.

Currently, ASSIGN CHANNELS and SHOW CHANNELS are the only two menus in the SEPARATE OUTPUTS editor.

NOTE: When SHOW CHANNELS is ON, the MIDI light does not light up. Also, the Sequencer Mixboard overrides the Show Channels display.

## NEW KEYBOARD EDITOR FEATURE : ASSIGN REGIONS TO OUTPUTS

A new feature has been added to the Keyboard Editor that allows you to get the most out of your 250's Separate Outputs. Now you can create and save Keyboard Setups that have output channel assignments determined by regions within Keyboard Setups. You can have up to 88 regions per Keyboard Setup and each region can be assigned to an arbitrary subset of the twelve outputs. If you have existing sequence tracks that you wish to update to use Separate Outputs, you

can do so by creating Keyboard Setups with output designations and assigning them to the tracks.

When you are in the Keyboard Editor, first designate a keyboard region in the usual manner (press SET POINTER, then strike high and low keys to specify the region of the Keyboard). Next press CONTINUE (ASSIGN TO KEYS on older units). The Mixboard LEDs will light and the first line of the display will read "SELECT OUTPUT CHANNELS." The second line of the display will indicate the outputs that this region is currently set to play through. Press Mixboard buttons to turn outputs on and off for this region, then press SELECT to accept the edit (press any other key before pressing SELECT to abort your edit). You can continue in this fashion as long as you wish, selecting regions and assigning them to outputs. When you are satisfied, you can save the Keyboard as usual.

## NOTES

1. To hear the effect of the editing that you have just done, the performance keyboard (or whatever source channel you are using) must be set to USE KEYBOARD REGIONS. (See the discussion above about the Separate Outputs editor.)

2. The regions being referred to here are independent of layers or splits that already may exist in a Keyboard Setup. If you add a layer to a Keyboard Setup, for example, that layer will use the same output assignments as the other layers. This means that if you have a two-layer Keyboard Setup using different Keyboards in each layer, and you assign a region of that Keyboard Setup to a single output, only one layer of that region will sound.

3. The factory Keyboard Setups all default to one region containing all 88 keys and that region is assigned to play out of all twelve outputs.

4. The more output regions you have assigned to a Keyboard Setup, the more memory it will take up. Because of this, you may not be able to store as many user-defined Keyboard Setups in your 250's memory at one time.

5. QLS still works correctly, but you will need a new version of KbdMover to move Keyboards with output assignments. If the new

KbdMover is not included in your Separate Outputs upgrade, you can get a copy from PAN or from your Kurzweil dealer.

## NEW CHANNEL STEALING OPTION

There is a new item in the channel stealing editor (F-10) called "STEAL FOR CHORUS NOTES?." This is either ON or OFF. If it's ON, then notes generated by the chorus effect can steal any other note (within the constraints of the other channel stealing settings). If it's OFF, then notes generated by the chorus effect will steal only those notes generated by the chorus effect.

For access to this feature from PLAY Mode, press F, then press the LEFT ARROW key twice. The display will read "FUNCTION: CHANNEL STEALING." Press SELECT then press the LEFT ARROW key once. The display will read "STEAL FOR CHORUS NOTES?" Press SELECT and the display will read "STEAL FOR CHORUS NOTES: OFF." The LEFT ARROW and RIGHT ARROW keys will toggle this from OFF to ON and vice versa. Use the UP ARROW key to get to the next item in the Channel Stealing Editor menu, or press PLAY to get back to PLAY Mode. After a hard reset, this item will default to OFF.

## MIDI PROGRAM CHANGE FUNCTION

A new and powerful feature has been added that allows you to quickly and easily send program changes to your external devices on any MIDI channel. While in PLAY Mode, press the INSERT button and the display will read "SEND MIDI PROGRAM CHANGE ON CHANNEL 1." If that is the channel you wish to send the program change on, simply enter the desired program number using the keypad, then press SELECT to send it. If you make a mistake entering, press the R button to clear the value. If you want to send a program change on a MIDI channel other than 1, then after you press the INSERT button and before you enter the program number, select the MIDI channel by either using the ARROW keys to step through the available MIDI channels or by pressing one of the 16 leftmost front panel buttons to directly access the channel you want. Not all of these buttons are present on the 250 RMX, so you'll probably use the cursor keys. The 250 remembers which channel you last chose so that the next time you use this feature it will default to that same channel.

The 250 utilizes MIDI "running status" which some devices may not work with. If a device does not respond to a program change that you send, press any key on the 250 keyboard, or move the pitch or mod wheel, or depress one of the pedals to "clear running status," then send the program change again.

## MAINTENANCE EDITOR CHANGE

The "CHANNELS ON/OFF?" option in the maintenance editor (which hopefully you will never have to use) has been modified to use the Mixboard buttons to select channels in the same manner as in the Separate Outputs editor.

## SEQUENCER MIXBOARD

The Sequencer Mixboard feature has been set up to override the action of the Channel Activity Display. (See SHOW CHANNELS above.) This means that if you if you activate the Mixboard (by pressing the SEARCH button when the Sequencer is activated), you will no longer see the output channel activity until you deactivate the Sequencer Mixboard.

## HARDWARE NOTES

Each of the twelve new output jacks contains a switch so that if an audio cable is plugged in to it, the corresponding channel is removed from the mixed outputs. Therefore, if you have audio cables plugged into all twelve Separate Outputs, you will hear nothing out of the stereo outputs. If you are plugged into none of the Separate Outputs, then you will hear all twelve of the 250's channels coming out of the stereo outputs.

The new Separate Outputs are high level, similar to the existing "HI" outputs on the 250. When you are recording sounds via the digitizer (sampler), you can now monitor your recording on channel (output) 12. This has the potential to cause feedback, so use care with this feature.

## VOLUME CONTROL WITH SEPARATE OUTPUTS

In the K250 and the 250 RMX, the volume slider controls internal circuitry in two places. In the range from full off to mid-scale on the slider, internally the actual volume scaling is done by the stereo output mixer VCAs. From mid-scale to full volume, volume scaling is done in the individual channels themselves, before the signal gets to the group A/B switches. It was necessary to do this in the design to maximize the signal/noise ratio of the sound. This is one of the reasons that the 250 is as quiet is it is. If you turn up the amplifier to which the 250 is connected high enough to be able to hear the 250's background noise, you can do the following experiment (don't touch the keyboard with the amplifier turned up this high!):

Notice that as the volume slider is moved from off to mid-scale, the noise increases gradually. But at mid-scale, the output noise stops increasing and remains constant as the slider is moved on up to full scale. So as the slider moves from mid-scale to full scale, the sound output level will increase while the noise stays the same. This is the reason that the noise performance is best when the volume slider is operated at full scale. But what this means is that the volume slider only works on the separate outputs from mid-scale to full scale. This also means that the separate outputs will typically be quieter than the stereo outputs! From mid-scale to full scale is where the volume slider should be set. It is possible, however, to use the separate outputs in the lower half of the volume control slider's range. Simply assign the volume function to one of the assignable sliders, and then use that slider as the master volume control. Of course the normal volume slider should still be used to set the overall volume of the instrument.

*Ver. 6.0 Updates*

## VERSION 6.0 UPDATE NOTES

The Keyboard and Instrument Editors have been modified to make them easier to learn and use. Hopefully this will benefit all 250 users, even those who already know the 250 inside and out. The majority of these changes have been proposed by our most experienced users.

The basic idea is to standardize the interface so that all the editors work in much the same way. This standard is based on the current Sequence, MIDI, Digitizer, and F Editors. Note that the Instrument

Editor is already pretty close to this standard; the Keyboard Editor has undergone the most significant changes.

The standard is as follows:

1) Each editor is arranged as a series of menu items, each item numbered and named.

2) If there are more than about a dozen items, there is a menu hierarchy, with the first N menu items being categories.

3) You can go directly to the item wanted by typing in the item number and pressing SELECT.

4) You can also go directly to an item by pressing a front panel button that corresponds to that item; if there are more items than available front panel buttons, then the least frequently accessed items do not get a button.

5) You can also navigate the menu items with the cursor keys. While navigating, SELECT acts like DOWN CURSOR, and PLAY acts like UP CURSOR.

6) After you get to the item you want, the item is activated by pressing SELECT or DOWN CURSOR.

7) If the item does not automatically exit, it can be exited by pressing PLAY, unless you have made changes that will be lost if you exit without saving. The 250 will prompt you to save in this case.

## LIST EDITOR

The Setup List Editor (entered by pressing EDIT, LIST from Play Mode) has been improved. It is now much faster and more intuitive to use. Enter this editor and you will see something like "SETUP LIST ENTRY: 1/KURZWEIL GRAND PIANO 1". At this point, simply use the right and left cursors to move through the Setup list, and the up and down cursors to change Keyboard Setups. You can also type in the Keyboard number followed by SELECT to go directly to the Keyboard desired. To go directly to the list entry desired, first press LIST, then type in the list entry number, then press SELECT.

## RECEIVE CHANNELS EDITOR (MULTIMODE EDITOR)

In the MIDI editor under RECEIVE OPTIONS is the item "RECEIVE CHANNELS?" (MIDI 11). This sub–editor, which allows you to assign a keyboard setup to each of the 16 MIDI channels, has been improved.

Upon entering this editor, you will see something like "MIDI CHANNEL 1?/CURRENT SETUP" where the top line of the display indicates the MIDI channel, and the bottom line the assignment for that channel. The possible assignments for a MIDI channel are CURRENT SETUP, OFF, or a Keyboard Setup number.

At this point use the left and right cursor keys to move through the MIDI channels or press front panel buttons to go directly to the MIDI channel desired (try the buttons to the left of the display); when the desired channel is in the display, press SELECT (the '?' turns to a ':').

Now you can modify the assignment for that channel. Use the right and left cursor keys to scroll between CURRENT SETUP, OFF, and some Keyboard Setup (initially Grand Piano) or press NO to go directly to OFF, or KEYBOARD to go directly to the Keyboard Setups.

At this point if the display shows the name of a Keyboard setup, you can type in the number of the desired Setup directly, or scroll up and down through the available Setups. Selecting the assignment you have chosen turns the ':' back to a '?' and advances you to the next MIDI channel.

## SYSTEM EXCLUSIVE EDITOR (F 12)

A new "F"editor has been added to the 250 that handles system exclusive related functions. To enter this function, press F, 1, 2, SELECT, SELECT.

The choices in this editor are DUMP SYSX DATA, SET SYSX ID, and ECHO DISPLAY TO MIDI.

## DUMP SYSX DATA

This function allows you to perform QLS–like operations over MIDI,

saving libraries and other stuff to external sequencers.

## SET SYSX ID

This function is primarily used in cases where you have more than one 250, but can also be useful if you want your 250 to ignore received system exclusive messages. Note that this is really setting a type of device ID, and not the actual manufacturer's unique Sysx ID. The Kurzweil Manufacturer's Sysx ID is permanently set to 7.

## ECHO DISPLAY TO MIDI

This function turns "echo display" on or off. This should normally be set to off. When echo display is on, the 250 will send information over MIDI in the form of a system exclusive message every time the 250's display changes. This feature has been included at the request of our handicapped users so that a computer (such as the Mac) can speak the display.

## 1000 SERIES REMOTE CONTROL MODE

This is a new function for the 250 that allows you to remotely control multiple 1000 series units from the 250's front panel. You will most likely need a MIDI merge box of some sort (passive is fine) to use this mode effectively, but it suffices to say that you must have the MIDI OUT port of your 250 connected to the MIDI IN port of your 1000, and vice versa. When you have them connected properly, press the R button in the center of the cursor diamond. This puts the 250 in Remote Mode.

You should see the display of your 1000 in the 250's display, as well as "Remote/ID=0" on the right side of the display. If don't see it, check Sysex ID of your 1000.

## K250 RAM CARTRIDGES

Version 6.0 with a cartridge adaptor supports the use of a RAM cartridge with the K250. The RAM cartridge extends the onboard memory

of the K250 to store:

Sounds
Sequences
Keyboards & Instruments
Bin Banks
MIDI Lists

NOTE: Do not attempt to use a RAM cartridge in your K250 unless you have Version 6, and a cartridge adapter installed. Failure to do this could damage your unit.

## SUMMARY

The differences in hardware are: (1) Individual Outs, and (2) the Cartridge.

The differences in software are: (1) the Keyboard and Instrument Editors, (2) the List Editor, (3) the Receive Channels Editor, (4) the System Exclusive Editor, (5) the 1000 Series Remote Control Mode.

For detailed information on these new features, refer to the appropriate sections in Volume Two, *The Reference Manual.* For applications-oriented information on these new features, see the corresponding chapters in Volume One, *The User's Guide.*

# Appendix B

# External Software for the 250

Appendix B

# *External Software for the 250*

This chapter looks at four different external software programs for the 250:

- QLS (the Quick Load System),
- Keyboard/Instrument Mover,
- Sequence Mover, and
- SD Convert.

*The Macintosh Connection*

## WHAT IS QLS?

QLS is a computer interface program that allows you to transfer information between the Kurzweil 250 digital synthesizer and the Apple Macintosh personal computer. It provides off-line storage for Keyboard, Instrument, and MIDI setups, sequences, and banks/list assignments from any standard Kurzweil 250. If your Kurzweil 250 contains the Sound Modeling Program, QLS also allows you permanent storage of Soundfiles off-line on Macintosh disks.

QLS is similar to MacAttach, Kurzweil's first computer interface program, in that it provides the user with the ability to load/save objects to and from the 250. QLS has additional enhancements such as:

- Faster load/save time (about 6 times faster).
- Librarian

- Uncomplicated operation. (All commands are issued from the Macintosh—the 250 is never touched.)
- Either Modem or Printer port may be used.
- Switcher™ and Multifinder compatible.
- Ability to load/save individual Soundfiles.
- Unique icons for each file type.
- Two cable lengths: 3 meters (10 feet) included with your QLS kit; 18 meters (60 feet) available at additional cost, on special order from your Kurzweil dealer.
- 100% MacAttach compatible.

## KNOW YOUR MAC

Before you start using QLS, familiarize yourself with the Macintosh itself. The *Guided Tour of Macintosh* is highly recommended for this purpose. You should feel comfortable with dragging, selecting, pulling down menus, disk swapping, and copying files on the Macintosh to get the most out of QLS. All QLS operations are initiated from the Macintosh.

## REQUIREMENTS

Your 250 must be equipped with the current production version of software.

In order to use QLS with your 250, you must have a 512K Macintosh, Macintosh Plus, Macintosh SE, or Macintosh II. 128K Macs will not work properly with QLS. If your Mac has been upgraded from 128K to 512K, it will work fine. QLS will work with the old Macintosh file system (MFS) or the new Hierarchical file system (HFS). QLS will also work with 400K and 800K floppies, and hard disks.

## SETTING UP QLS

Your QLS package contains the following:

- This manual (contained in 250 manual pack with units).
- A QLS 3 meter cable.
- A Macintosh diskette containing the QLS software.

Attach the QLS cable to the computer connector on the rear of the 250. Attach the other end to either the Modem or Printer port on the rear of your Macintosh. Note that if you own a Macintosh Plus you must purchase the Macintosh Plus Peripheral Adapter (mini-DIN to DB-9 cable), Apple Part number M0199. This short, 8 inch adapter is the only one that works; longer adapters or homemade adapters will not work. If you connect to the Printer port, you must select the Printer port using the Set Port option in QLS (see the section on Set Port below). If you are using an A-B switch to switch one of the Macintosh's serial ports between two devices, you should connect QLS to the unswitched port on the Macintosh. QLS will behave unpredictably when it is connected through a serial port switch box.

## PREPARING TO USE QLS

The QLS disk provided is intended to be used on a 512K Macintosh with the old MFS file system and 400K drive(s). The disk can be used as a boot disk on these systems. If you have a different system, you will need to copy the QLS application onto any one of your system disks to use it. It does not matter whether QLS is run from an internal, external, or RAM disk; all will work.

Before you attempt to use QLS, it is a good idea to make a backup copy of the program. This is best done by copying QLS to whatever system disk you are using, and then storing the original QLS disk in a safe place.

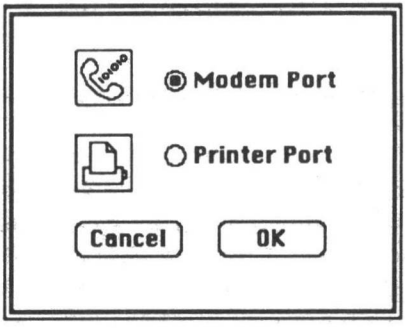
To launch QLS, the following must be done. Copy QLS to your Macintosh system disk. Boot the Macintosh with the System/QLS disk in either floppy drive. To start up QLS, double-click on the QLS icon. QLS will now start up.

**EXTREMELY IMPORTANT:** The first time you use your new version of QLS, two things must be done. First, if you have attached the QLS cable to the Printer port of the Macintosh you must go to the Set Port option and change the current port to be the Printer port. This is described in the **Set Port** section of this manual. After doing this, you must set the 250 configuration as described in the **Set 250 Configuration** section in this manual. This is because QLS must know which version of 250 software it is talking to. As shipped, QLS Version 2

expects the QLS cable to be attached to the modem port, and expects to be talking to 250 Version 4 software. If this is not the case, you must Set Port and Set 250 Configuration so that QLS will function correctly. These two steps need only be done the first time you use QLS. QLS will remember the port to use, and the 250 configuration even after you quit QLS and re-launch it. Remember, if the configuration is not set correctly, QLS will not work properly. Set Port and Set 250 Configuration should be the first transactions you do with QLS.

## SET PORT...

First, if you have attached the QLS cable to the printer port of the Macintosh you must go to the Options Menu and select the Set Port option to change the current port to the printer port. Set Port allows the user to choose which Macintosh serial port will be used to communicate with the 250. As mentioned above, QLS always uses the modem port when the application is first launched. You may, at any time, decide to switch to the other serial port. Of course, the QLS cable must also be switched. After Set Port is selected, QLS displays the following dialog:

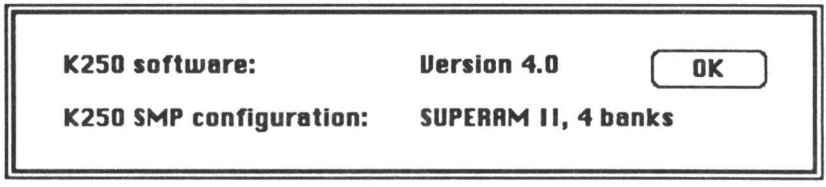



Click on the desired port's button, and then on OK. The newly selected serial port will now be used for QLS communications. QLS will remember the port to use regardless of whether QLS has been quit and relaunched.

## SET 250 CONFIGURATION

QLS must know which version of 250 software it is talking to. As

mentioned earlier, QLS defaults to 250 Version 4 software. Therefore, if you do not have Version 4 software, you must set the 250 configuration. Select Set 250 Configuration from the Option menu. Set 250 Configuration automatically queries the 250 and determines the current 250 operating software version and the 250 digitizer memory configuration. After doing so, it displays the following dialog:




The dialog above will be displayed *only* if your 250 has version 4.0 software and SUPERAM II.

Set the configuration to let the Mac know which version of 250 software you have before using QLS to load and save objects to and from the 250. If an error occurs while setting the configuration, check that all cable connections are secure and that QLS is using the correct port. (See Set Port.)

*Using QLS*

## QLS AND MACATTACH FILES

QLS files are nearly identical to MacAttach files. The major difference is that the Macintosh can distinguish between different QLS file types, whereas all MacAttach files look the same. This means that QLS files can have different icons for each file type. The following diagram shows the various QLS icons for all the possible file types. One of these, the individual Soundfile, is unique to QLS and is in no way compatible with MacAttach. Only QLS can load and save individual Soundfiles. QLS provides a method by which all files (except individual Soundfiles) may be saved as a MacAttach compatible file. This means that the file will be assigned a MacAttach icon so that MacAttach will be able to recognize it. This feature is provided so that QLS users can create disks that MacAttach owners can load. Similarly, QLS can load any MacAttach type file. This means that all existing files created by MacAttach can still be loaded into the 250.

## QLS FILES

The following 250 files can be loaded and saved with QLS.

## KEYBOARD SETUP LIBRARY

This library contains all of the 250 Keyboard Setups that you have created with the 250 Keyboard editor. These are Keyboard numbers 250 through 289.

## INSTRUMENT SETUP LIBRARY

This library contains all of the 250 Instrument setups that you have created with the 250 Instrument Editor. These are Instrument numbers 250 through 297.

## SEQUENCE LIBRARY

This library contains all of the 250 sequences you have created with the 250 sequencer. They are sequence numbers 1 through 40.

## KEYBOARD & INSTRUMENT LIBRARIES

This is a combination of the Keyboard and Instrument libraries.

## KEYBOARD, INSTRUMENT, & SEQUENCE LIBRARIES

This is a combination of the Keyboard, Instrument, and sequence libraries.

## DIGITIZER MEMORY

This file contains the entire used memory of one digitizer bank. It contains up to 500,000 samples of sound data, one Instrument definition (the DIGITIZER INST), up to 16 digitizer Keyboard setups, and up to 64 digitizer Soundfiles.

## INDIVIDUAL SOUNDFILE

This file contains all the samples and data for one digitizer Soundfile. (This file cannot be used with MacAttach.)

## KEYPAD BINS

This file contains the assignments of your 250 keypad bins.

## LIST

This file contains all the assignments of your 250 Keyboard Setup list.

## MIDI

This file contains all 250 MIDI parameters, including the MIDI mode, channel assignments, and all other parameters set up with the 250 MIDI editor.

## CTLS

This file contains all 250 controller assignments, and all vibrato, tremolo, and pitchbend parameters for all 250 performance channels.

## THE QLS ICONS

The illustration on the following page shows all QLS icons and the objects they are associated with. Remember, MacAttach files can contain any type of 250 object except individual Soundfiles.

# *The QLS Icons*

*QLS Application*


*Instrument Library*


*Keyboard Library*

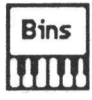

*Keyboard & Instrument Libraries*


*Sequence Library*


*Keyboard, Sequence, & Instrument Libraries*


*Individual Soundfile*


*Digitizer Memory*




*Keypad Bins*


*Keyboard Setup List*

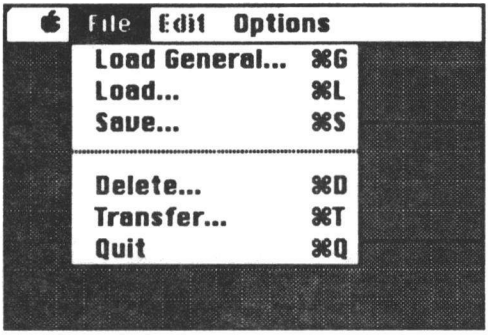

*MIDI Setup*


*Assignable Controls*

*MacAttach File*

## THE FILE MENU

The File Menu contains file-specific operations. The functions to loa save, and delete files and transfer to another application or to the Finder are located here.



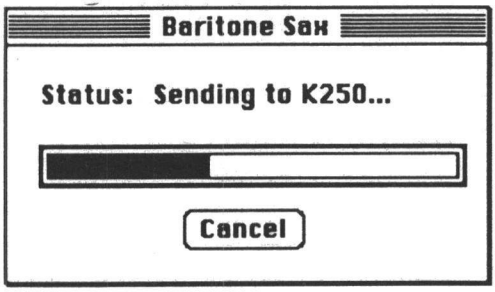

## QLS AND THE 250

When you select a load/save operation, QLS takes over the 250 and the display on the 250 will read "QLS transaction in progress...". The 250 will not respond to anything until QLS releases its control. This happen either by the successful termination of an operation, or by u abort. Currently, you can abort an operation by simultaneously pres ing the command and period keys on the Mac. Aborting in the midd of a load operation may leave corrupted data on the 250.

CAUTION: Before loading any file or files into the 250, be sure to sa any valuable files already in your 250 onto a Macintosh disk. The following load functions will replace any existing files in the 250's memory (sequencer, digitizer, etc.) with the file or files that you are loading in.

When loading or saving small files (files smaller than 50,000 bytes), QLS will change the cursor into a wristwatch and change it back to arrow when done. This transfer can be aborted by pressing the com mand and period keys on the Mac.

For larger files, QLS will display the following dialog box containing gauge and a Cancel button:

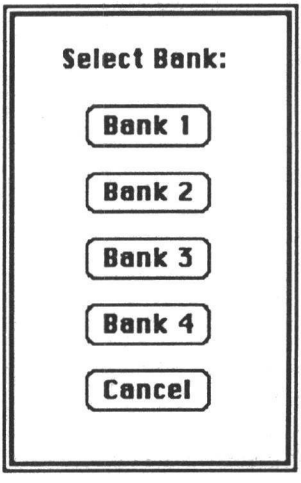



The window title is the name of the file being transferred, in this case, Baritone Sax. The cursor will remain an arrow so that the Cancel button can be selected. When the gauge is full, the transfer is done, and the dialog will go away.

## LOAD GENERAL...

The Load General command allows the user to load any file into the 250. QLS will determine what information the file contains and will load it into the proper place on the 250. After Load General is selected, the user is given a standard file dialog box containing all QLS files and all MacAttach files. The user selects a file and QLS loads it into the 250.

When loading either a digitizer memory file or an individual Soundfile, QLS may ask which digitizer bank to load the file into with the following dialog:

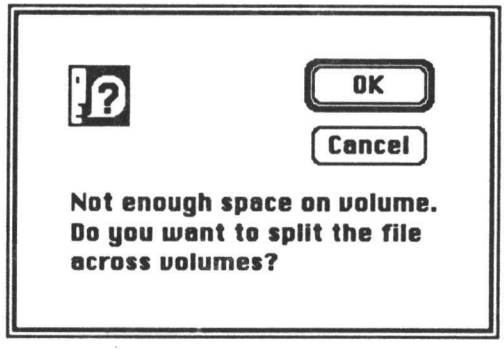


The above dialog will appear if your 250 is equipped with SUPERAM II (4 banks). If your 250 has SUPERAM I (2 banks), the Bank 3 and Bank 4 buttons will be disabled (shaded). If your 250 is equipped with CGP RAM (1 bank), this dialog will not appear, and the file will be loaded into bank 1.

When loading an individual Soundfile, the Soundfile will be assigned the lowest available number in the selected bank's list of sounds. Its name will be the same as the Macintosh filename, except truncated to 20 characters. The sound will be automatically assigned to the DIGITIZER PREVIEW KBD in the selected bank. For instance, if you are loading a Soundfile into bank 1, the Soundfile will appear on Keyboard number 500 at middle C. Thus, you may preview the sound on the 250 by selecting Keyboard number 500 after loading. The sound will not be assigned to any other Keyboard.

## A WORD ABOUT SPLITTING FILES

If a file is selected for saving, and the file is too large to fit on the selected volume (disk), QLS will ask you if you want to split the file across volumes:




Answering OK causes QLS to save as much as possible on the selected volume. When the volume is full, the user will be given a file dialog box and will be asked to select the next file in the split file. Note that this will almost always involve 1) ejecting the disk that has just been filled, 2) inserting an empty disk, and 3) naming the next file in the split file. QLS will suggest a name for the continuation split file consisting of the original name with a '+' appended. You should abide by the suggested naming convention. When saving a MacAttach compatible

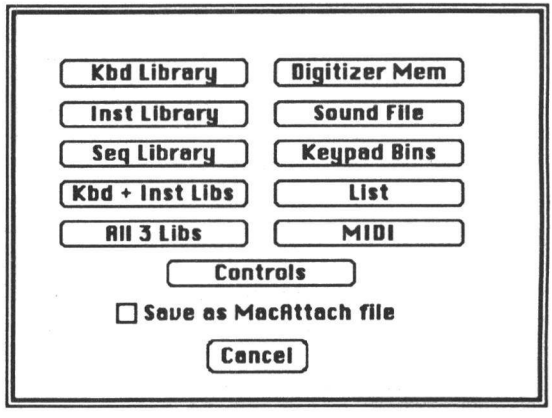
split file, the files must use the suggested naming sequence because this is the only one MacAttach will understand. Also, the MacAttach compatible split file must fit onto two volumes. MacAttach only allows two files per split file; QLS allows *any* number of files for a single split file. As soon as the current volume is full, the process of ejecting, inserting, and naming is repeated until the split file has been saved in its entirety.

The process of loading a split file is similar. The user must select the first file in the split file to load. QLS will load the contents of this file and will then display a file dialog box so that you can select the next file in the split file. As with saving, this will probably involve ejecting the current disk, inserting the disk that contains the next file in the split file, and selecting this file as the next file to load. This process is repeated indefinitely until the entire split file has been loaded. Note that loading the files in the wrong order will not work and may cause QLS to hang.

**PLEASE NOTE:** On Macintoshes with HFS (Hierarchical File System), QLS sometimes does not recognize a floppy disk being inserted when attempting to open the second file of a split file. Clicking once on the folder menu will cause the Macintosh to recognize the disk. The folder menu apears directly above the box containing the list of files.

## LOAD...

The Load command allows you to load a file into the 250. You are asked for a *specific type* of file to load with the following dialog:

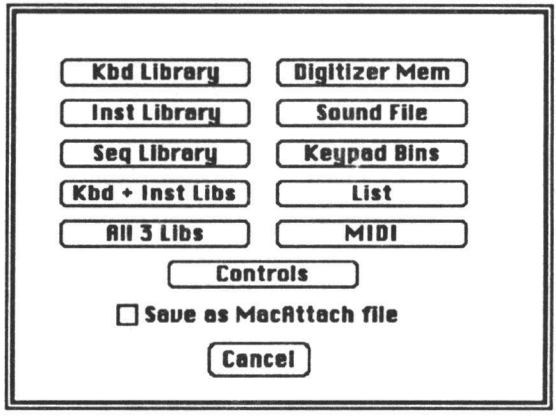


After selecting the type of file to load, QLS displays a standard file dialog box containing only files of the type specified. You select one of these files and QLS will load it into the 250. It's advantageous to use Load instead of Load General if you have many files, and need to see only the files of a particular type. Note that this distinction can be made only between QLS created files; all MacAttach files look the same to the Mac (they all have the same icon). There is no way to select, for instance, all MacAttach files that contain Keyboard setup libraries.

## SAVE...

IMPORTANT: Be sure to initialize your disks prior to using the Save function. (See your Macintosh manual for initializing disk procedure.)

The Save command allows you to save objects from the 250 to files on the Macintosh. After selecting the Save function, QLS displays the following dialog box:

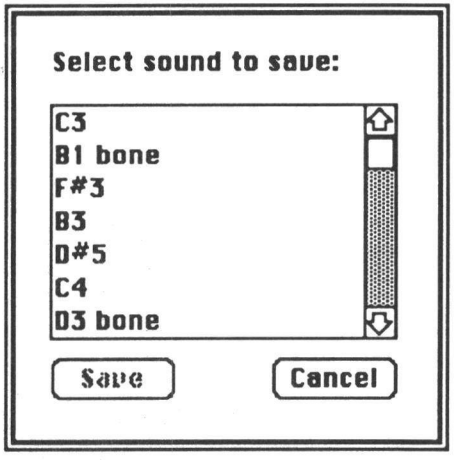



Select the file (or library of files) to save by clicking on one of the buttons. If the file selected is a Soundfile or digitizer memory and the digitizer has more than one bank, the bank select dialog will appear as described in the **Load** section above, and you must select the bank to save from. QLS will display a standard save file dialog box and ask you to name the file. If there is not enough space on the selected volume (disk) for the file, QLS will ask if the file should be split across volumes, as described in the split file section of this manual.

If you wish to save a file as a MacAttach compatible file, you must *first*

click on the button labeled, "Save as MacAttach File", *then* select the object to save. In this case, the file will be saved as a MacAttach compatible file and will appear with a MacAttach icon. Note that individual Soundfiles are not supported by MacAttach, and are not selectable if you also select MacAttach compatibility.

When saving an individual Soundfile, QLS retrieves a list of all Soundfiles currently loaded in the selected digitizer bank from the 250. It then displays the following selection dialog:




The dialog shows all the Soundfiles currently loaded in the selected 250 digitizer bank. To select a particular sound to save, double click on the desired sound, or click on a sound and then on the Save button. If there are more sounds than can be displayed in the select box, a standard scroll bar is provided.

## DELETE...

Delete allows the user to delete any file from a disk. Delete will display a standard file dialog and you may select any file. After a confirmation dialog, the file will be deleted. Note that *any* file may be deleted, not just QLS and MacAttach files. This is useful for creating space on a disk without having to exit to the Finder (an application found on the Mac's desktop, used to manage documents, applications, and to access disks). *Never* delete the file "Desktop"; it is a hidden file that contains all the file icons and other information the Finder needs.

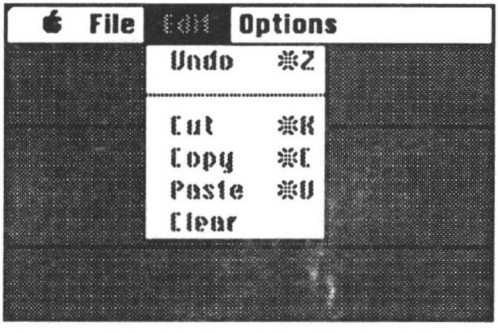
## TRANSFER...

Transfer allows you to transfer program control to another application without first returning to the Finder. A standard file dialog is displayed showing all application files. Select an application and QLS transfers immediately to that application. Selecting Cancel returns you to QLS.

## QUIT

Quit exits the QLS program to the Finder.

## THE EDIT MENU




The Edit menu is provided only for use with desk accesories (not as a part of QLS) that may require an Edit menu. When a desk accessory is opened, the File and Options Menus will be disabled, and the Edit menu will be enabled. When all desk accesories are closed, the Edit menu will again become disabled, and the File and Options menus will be re-enabled.

## THE OPTIONS MENU

The options menu contains a variety of functions including the Set Port option and the Set 250 Configuration option that you are already familiar with.

## SHOW 250 CONFIGURATION

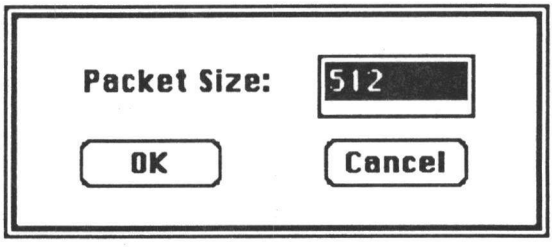
Show 250 Configuration simply shows you the current configuration.

## LOOPBACK TEST

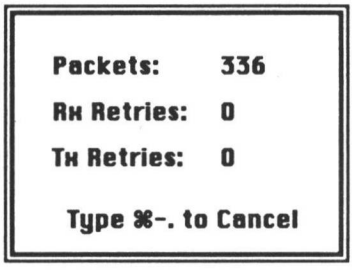
Loopback Test need be used *only* if difficulty is encountered with the QLS system.

The loopback test allows you to run diagnostics on the QLS system. It is a good way of determining if there is any sort of hardware malfunction in the 250, the Macintosh, or the QLS cable. The loopback test sends a chunk of data (referred to as a packet) from the Macintosh to the 250 and then back again to the Macintosh. The packet contains all possible bit combinations that may be sent. This process is repeated indefinitely until too many errors occur or you stop the test. During the test, QLS displays the number of successful round trips that have been made, and the number of transmit and receive retries that have accumulated.

After loopback test is selected, the following dialog is displayed:




The packet size refers to the size of each chunk of data that is sent. 512 bytes is the default, and also the maximum size for this test. Users should normally select 512 bytes for this test. After selecting the size, the loopback test is started, and the following dialog appears:




The Packets display shows how many packets have been sent from the Macintosh to the 250 and back to the Macintosh. The Rx and Tx Retries entries show how many receive and transmit retries, respectively, have been accumulated. Normally, these will always be zero. If these numbers do not stay at zero, it implies that something is wrong with your 250, Macintosh, or QLS cable. The loopback test does not terminate by itself. It will run forever. If the Packets count gets to 1000 before any retries occur, this is sufficient proof that your QLS is physically working well. Cancel the test by simultaneously holding down the command and period keys on your Macintosh Keyboard.

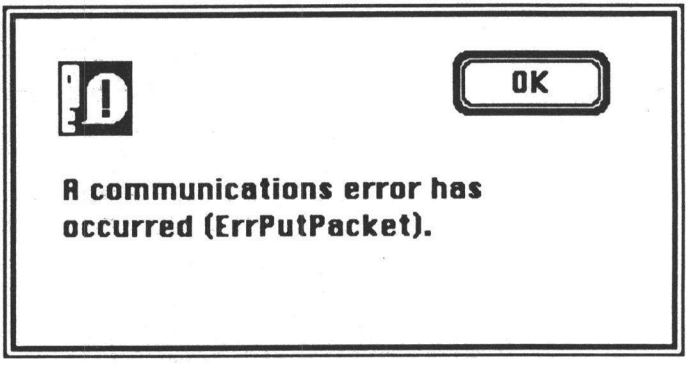
## ERROR MESSAGES

There are three types of errors reported by QLS: software errors, communication errors, and errors returned by the 250 digitizer when loading or saving individual Soundfiles. Each error causes an appropriate alert dialog to be displayed on the Mac. After the user clicks on OK, the transaction is aborted.

Software errors cause the following alert dialog to be displayed:

Each software message error reports the function that caused an error and the status value of the error. All software errors should be reported to Kurzweil Music Systems for resolution.

Communication errors cause the following alert dialog to be displayed:




Under adverse circumstances, there are a number of communications errors that can occur, but users will probably only see the following three: ErrPutPacket, ErrNoPacket, and ErrRetries.

**ErrPutPacket** will occur if you fail to connect the QLS cable to the selected Macintosh serial port, or if the 250 is powered off. Also check that the 250 is equipped with QLS.

**ErrNoPacket** will occur if the 250 is equipped with QLS, but the user has selected MacAttach in the 250 maintenence editor (under computer link). Select QLS. Also, this message will occur if your cable is loose, or disconnected.

**ErrRetries** occurs when QLS cannot reliably send data. Check your connections, and remove any switchboxes or other peripherals that may be attached to the Mac. If it still fails, contact the Kurzweil Customer Service Department at (617) 893-5900.

When loading/saving digitizer memory files or Soundfiles, the following errors may occur:

**Digitizer software not installed**. Your 250 is not equipped with SMP and cannot load or save digitizer memory files or Soundfiles.

**Digitizer memory broken or not installed.** Your 250's digitizer memory is either not installed, or has not passed memory tests. To retest the memory, you must hard-reset the 250. (See the 250 user's manual.)

**Bank not initialized.** The selected digitizer bank has not been initialized. You cannot save Soundfiles from an uninitialized bank.

**Not a valid bank.** The selected bank does not exist. This can only happen if your configuration is wrong. See the **Set 250 Configuration** section.

**Sound too short to load.** The minimum length of a 250 sound is 50 milliseconds. This error will occur if you attempt to load an individual Soundfile that is shorter. All sounds that you save from the 250 will be at least this length, so this cannot occur unless the sound was created by some other Macintosh program.

**Not enough free samples in bank.** The selected bank does not have enough free samples to load the selected sound. One way to free up samples is to delete sounds in that bank.

**Too many sounds in bank.** The selected bank already contains the maximum number of Soundfiles which is 64. Soundfiles in this bank must be deleted before more sounds can be loaded.

## USER NOTES

On certain 250s, using the MacNifty™ switch box to switch the Mac port between QLS and some other application will have undesirable effects. The symptoms of this problem occur when the MacNifty switch is selecting the other application to use the Mac port, and QLS is switched off. This sometimes causes the 250 to hang up entirely or perform very sluggishly. It's quite noticable. When the MacNifty switch is selecting QLS, the problem goes away and QLS works fine.

QLS will not work properly with the MacBottom™ hard disk regardless of which ports are used to connect MacBottom and QLS. It seems that, when loading sounds into the 250, the MacBottom disk reads bad data, which is then sent to the 250. This results in garbled sounds on the 250.

QLS is not intended for 128K Mac operation. (Apple no longer supports 128K Macs.)

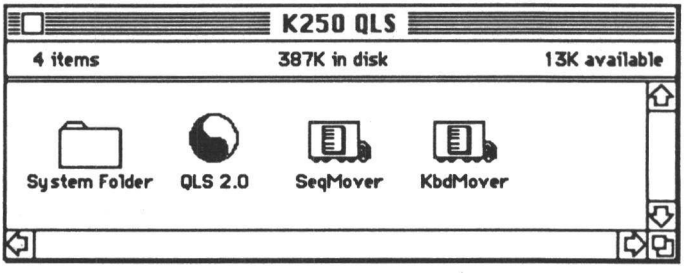
Loading split files out of sequence first may cause QLS to hang. Type command-period to recover. It is necessary that the user load split files in their proper order.

Disks initialized while using the Save function and subsequently, filled by this procedure, will be unreadable by the Finder. **Always** initialize disks **before** using the Save command. When QLS begins a transaction, all active 250 channels are immediately silenced, and the user will not be able to resume playing the 250 until the transaction has completed.

After loading/saving a file to/from the 250, it is necessary for QLS to soft reset the 250. Unfortunately, this causes the mute relay to click, which may cause a loud pop in your sound system. The user should take this into account.

*Sequence Mover & Keyboard Mover*

## SEQUENCE MOVER AND KEYBOARD/INSTRUMENT MOVER (SEQMOVER/KBDMOVER)




Included on the QLS disk are two powerful general purpose programs for maintaining libraries of Kurzweil 250 Sequences, Keyboards, and Instruments. KbdMover allows you to manipulate Keyboard Setups and Instrument Voicings, while SeqMover allows you to manipulate sequences.

The primary function of both of these programs is to allow you to reorganize collections of objects into new libraries. You can pick and choose sequences from various files to create new groupings of your

work. The same goes for Keyboard Setups and Instrument Voicings.

Here's an example. Let's say you have a file named, "My January Sequences" and another file named, "Last Septembers Sequences". Now let's suppose you want to take one of the sequences from "My January Sequences" and one of the sequences from "Last Septembers Sequences" and put them in another file, "My August Tunes". You would use the SeqMover to open each of these files and move the sequences where you want them.

SeqMover and KbdMover allow you to open two files at once and scroll through the objects stored in them. You can select individual objects and then Copy them to the other file, Modify the selected object, or Remove it from the current file.

On the next few pages you will see some of the screens which you will find in the SeqMover and KbdMover programs. The best way to see how these programs work is to put them in your Macintosh and fire them up.

## USING SEQMOVER AND KBDMOVER

A word of caution before you start. Please make backup copies of all important files of sequences, Keyboards, or Instruments you have before modifying them with these programs. It is possible that either you or the program could make a mistake and you might permanently lose something you really want. *Always keep backup copies of your important work!*

After starting up either of these programs you will see its main screen. Both library windows will be empty, and below each will be an Open button.

To create a new, empty file click on Open, and then click on the NEW button in the next dialog. This is a convenient way to start a completely new library.

To edit an existing file click on Open, and select the file you want. The file selection is identical to every other Macintosh application in this case. It does not matter whether you open your first file in either the left or right window.

Once you have selected a file to open, the disk should whirr a bit and then you will see a list of names displayed in the window you opened. Below the list of names you will see the name of the file, and the amount of free space in that file. If you selected the wrong type of file you will be informed, and you should try again.

Next move the mouse into the window with the list of names, point to a name and click. The name will be highlighted, indicating you have selected that item. In the lower part of the main window the program will tell you which item you have selected. Below the Remove button, the size of the object you have selected is shown.

Notice that when you select an item, the Modify and Remove buttons become activated. You must have an object selected in order to perform these functions.

If you click on Remove with an item selected, *the item will be removed irretrievably from that library.* Be very careful using this command.

If you click on Modify with an item selected, you will see a secondary dialog with different editing options. Both programs have a "Swap List Items" option for reordering the list.

The SeqMover lets you edit global sequence parameters. The KbdMover lets you edit Instrument settings.

In order to Copy an item from one file to another, you must have two files open. Click on the Open button under the empty window and select another file. (Be sure to choose a different one from the one you have open.) In a few seconds you will see the items in that file displayed in its window.

To Copy an object, click on what you wish to copy. Notice that the Copy button changes to indicate in which direction you can copy. Click on Copy. If there is enough free space, the object will appear in the next free slot in the list. You can copy the object into its new list as many times as you like. This is a good way to duplicate items for the 250.

Experiment with Open, Copy, and Remove on some backup copies of your files until you feel comfortable with them.

## SAVING YOUR CHANGES TO DISK

The changes you make in a file are not made permanent until you click on the Save button. Clicking Save writes the changes you have made onto the file you opened and closes the file.

If you decide you don't want to keep the changes you have made, click on Close instead of Save. Close d*oes not write anything onto your disk.* If you have made changes to a file, but have clicked Close, the programs will ask you if you want to save your changes before closing.

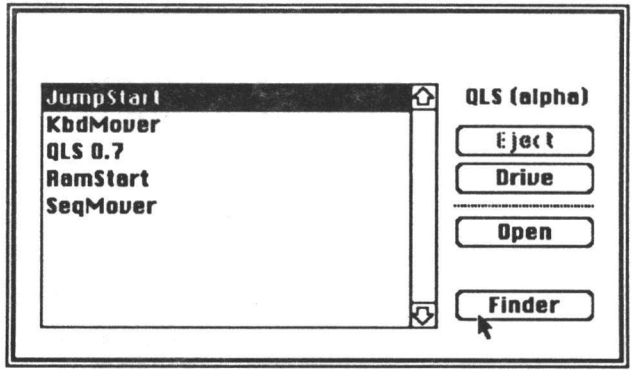
Close is very useful if you have not made any changes to your file, or you change your mind after editing and don't want to make any changes to a file.

Under some circumstances, the programs may tell you that a library file has been corrupted. If this happens use the Close option to be sure you don't save the corrupted image to your file on disk.

Be sure you understand the differences between the Save and Close buttons. Both functions clear the library window, but Save writes your changes onto disk, and Close does not.

## WHEN YOU ARE DONE

Click on QUIT to exit either program. Both KbdMover and SeqMover have a built in transfer capability which allows you to select the next program to run after you exit. This can speed things up tremendously if you just want to get into QLS or some other program.



If you want to return to the normal Macintosh desktop, click on the FINDER button.

## USING SEQMOVER AND KBDMOVER WITH SWITCHER™

Apple Computer has provided a wonderful program for the Macintosh called Switcher. It allows more than one program to be memory resident in the Macintosh and to be called up very quickly.

If you don't have Switcher, you can get it from your Apple dealer, or from your local Macintosh user group.

Both KbdMover and SeqMover are Switcher compatible. The KbdMover program requires a 150K partition and the SeqMover program requires at least a 220K partition to function properly.

Using these programs in Switcher has several benefits. On a 512K Mac you can run either SeqMover or KbdMover with QLS. This lets you make rapid edits and then load your results very quickly into the 250.

Using both KbdMover and SeqMover in Switcher is the quickest way to work on an elaborate "All 3 Libraries" file.

## WHICH FILES CAN SEQMOVER AND KBDMOVER WORK WITH?

KbdMover and SeqMover can work with data files created either by MacAttach or by QLS. SeqMover can edit either "Sequence Library" or "All 3 Libraries" type files. KbdMover can edit either "Instrument", "Keyboard & Instrument", or "All 3 Libraries" type files. It cannot edit "Keyboard Library" files in QLS format. You should always work with "Keyboard & Instrument Libraries" if you are using QLS. Files created by these programs are in MacAttach format.

# *SD Convert*

## INTRODUCTION TO SD CONVERT, DIGIDESIGN SOUND DESIGNER AND SOFT SYNTH

SD Convert is a Macintosh program developed by Kurzweil Music

Systems. It enables you to convert 250 Soundfiles created by QLS to Digidesign's Sound Designer format and vice versa. Once your QLS files have been converted, you can use the Sound Designer program to edit or create 250 Soundfiles. It also allows you to load files created by the SoftSynth program into the 250 once they have been converted to QLS by SD Convert.

## WHAT ARE SOUND DESIGNER FILES?

Sound Designer is a Macintosh waveform editing program (sound laboratory) developed originally for the Emulator 2 but now available for virtually all samplers. Its features include:

- Displaying waveforms
- Graphical editing of sounds (cut, copy, paste, mix, and mouse input)
- Frequency plots ("waterfall displays")
- Setting loop points
- Sound synthesis using the Karplus-Strong algorithm
- A variety of sound modifying filters
- Immediate sound playback using the internal Macintosh speaker

Since the original version of the Sound Designer program, two other versions have been customized for use with the Ensoniq Mirage and the Prophet 2000. Because all three versions use the same Soundfile format, it is possible to convert sounds freely between the three Keyboards. Thus, an E2 sound can be loaded into a Prophet 2000.

## WHAT IS SOFT SYNTH?

The SoftSynth program is an additive synthesis laboratory for the Macintosh. It allows the user to create sounds by adding waveforms of different types and pitches. There are four different waveforms which can be used as building blocks: sine waves, square waves, and two noise waveforms. Each sound may contain up to 32 waveforms summed together. Each of these waveforms may have an amplitude and a pitch envelope applied to them. The SoftSynth program creates Sound Designer compatible Soundfiles, so that Sound Designer can be used to edit the sounds after creation.

SD Convert converts any Sound Designer format Soundfile to a QLS Soundfile, and converts QLS files to Sound Designer format. Thus, not only are the functions of Sound Designer and SoftSynth available to 250 users, but also the sounds of the E2, Ensoniq Mirage, and Prophet 2000.

## WHICH VERSION OF SOUND DESIGNER DO I PURCHASE?

Because there are different versions of Sound Designer customized for various synths, a frequent question posed by users is which version of Sound Designer to purchase. Digidesign has suggested the Prophet 2000 version, possibly because it is the most generic version available. Any version of Sound Designer will work, however, so you should feel free to purchase the version which best fits your needs. For example, if you already owns an E2, it will be to your advantage to purchase the E2 version.

Note: There is only one version of the SoftSynth program, so this is not an issue with SoftSynth.

## THE SD CONVERT PROGRAM

### REQUIREMENTS

In order to use Sound Designer or SoftSynth, you must have a 250 with Version 3.2 or more recent software, the Quick Load System, and the Sound Modeling Program (the sampler). You also need a Macintosh (512K or larger), and a copy of the Sound Designer or SoftSynth program (or both).

### USING SD CONVERT

Operation of SD Convert is very straightforward. Let's say you have just sampled a sound on the 250, and you want to use Sound Designer to edit the sound. After you are satisfied with your editing, you want to reload the sound into the 250. The process is depicted below.

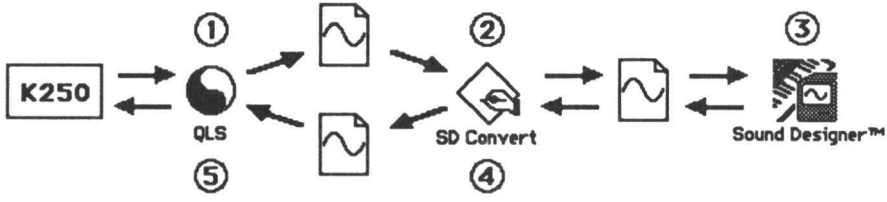
1. Use QLS to save the sound to a file on the Macintosh.

2. Use SD Convert to convert the Soundfile to a Sound Designer format file.

3. Edit the file using Sound Designer.

4. After editing is complete, use SD Convert to convert the Sound Designer file back to a QLS format Soundfile.

5. Use QLS to load the sound into the 250.

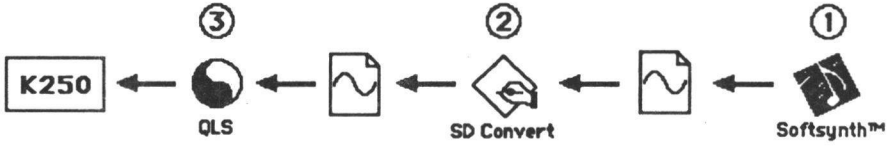



For another example, let's assume that you have created a sound using SoftSynth, and you want to load it into the 250. This process is depicted below.

1. Create the Sound Designer Soundfile using SoftSynth.

2. Use SD Convert to convert the Soundfile to QLS format.

3. Load the sound into the 250 using QLS.




To convert a QLS Soundfile to Sound Designer format, launch SD Convert and select the menu item QLS to SD... from the file menu. SD Convert will ask for the QLS file to convert, and then the Sound Designer output (destination) file. Both files are specified using the Macintosh standard file dialogs. After both files are specified, SD Convert does the conversion, creating the Sound Designer formatted Soundfile. Please note that you may save only *individual* Soundfiles in

this manner; don't confuse a soundfile with a digitizer memory file, an Instrument voicing or a Keyboard setup.

To convert a Sound Designer Soundfile to QLS format, launch SD Convert and select the menu item SD to QLS... from the file menu. SD Convert will ask for the Sound Designer file to convert, and then the QLS output (destination) file. Both files are specified using the Macintosh standard file dialogs. After both files are specified, SD Convert does the conversion, creating the QLS formatted Soundfile.

## SAMPLING RATES

Sound Designer and SoftSynth can create files at any sampling rate up to 50kHz. Files created at any sampling rate can be loaded into the 250. Similarly, all sounds recorded on the 250 can be edited with Sound Designer, regardless of their sampling rate.

## SD CONVERT'S TEMPORARY LIMITATIONS

There are certain limitations you should be aware of when using SD Convert. Some of these are limitations of the 250 which cannot be changed, and others are temporary limitations of the SD Convert program itself,which will be addressed in future releases of SD Convert. The following is a brief description of these limitations.

- The 250 cannot play sounds shorter than 50 milliseconds. QLS will not load sounds that are shorter than 50 milliseconds. It will display an error message to that effect. If a sound has been looped, the loop must be at least 50 milliseconds long, and the section of sound preceding the loop must be at least 50 milliseconds long. Also, loops must not be longer than 65536 samples. QLS will display an error message in each of these circumstances. It is not possible to create such sounds using the 250 digitizer, but it is possible when using Sound Designer or SoftSynth.

- The 250 can only have one looping section per sound, and this looping section must be at the end of the sound. Sound Designer, on the other hand, does not have this

limitation. When converting Sound Designer files, SD Convert only considers the samples in the sound up to and including the first (sustained) looping section. Samples following the sustained looping section and release looping sections, if they are defined, will be ignored.

- The current version of SD Convert does the simplest possible conversion from Sound Designer format to QLS format. If the sound has a lot of dynamic range (that is, loud portions as well as soft portions), the soft portions are apt to become noisy after loading into the 250. Future versions of SD Convert will have this corrected.

- When SD Convert is used to convert a 250 sound that has been compressed (that is, recorded with the 250 digitizer using either SLOW DECAY, NORMAL DECAY, FAST DECAY, or SPEECH), the sound will not be properly converted to Sound Designer format. The sound will appear in its compressed form, lacking dynamics. Sounds recorded with QUICK TAKE or DE-EMPHASIS do not exhibit this problem.

MASTERING THE 250

# *Index*

VOLUME TWO

# *Index*

## A



## B



## C

## D



## G



## H



## I *thru* J



## K

## L



## M

## N



## O



## P



## Q



## U



## V



## W



## X



## Y *thru* Z

NOTE: Actually, an exponential curve does not increase or decrease at a constant rate, but because we are measuring amplitude in dB (an exponential scale) the effect is one of a constant increase or decrease. Even though a sound's volume may be increasing or decreasing exponentially we perceive that volume change as being constant.

Each segment has two parameters which affect its behavior. A segment's End Limit determines how loud it will be when it reaches its end. A segment's Rate determines how long it will take to reach that end. The higher the End Limit, the louder a segment will be when it reaches its end. The higher the Rate, the faster a segment will reach its End Limit.

Once you have chosen a segment to edit, pressing the SELECT button allows you to edit that segment's End Limit. Pressing the SELECT button twice allows you to edit that segment's Rate. Use the VALUE slider to enter the values for Rate and End Limit. Once those values have been entered pressing the SELECT button one more time takes you to the next envelope segment.

**PLAY**

To add a new segment to an envelope press the INSERT button. The new segment will be a copy of the segment that directly follows the segment you are on and will be inserted directly following the segment you are working on. To erase a segment press the ERASE button. This will erase the segment immediately following the segment you are working on.

To exit CREATE/MODIFY ENVELOPE (INST 29) you must press the PLAY button.

The total amount of time it takes to play through the entirety of an Instrument's envelope depends on the number of segments and the length of each of segment. When trying to determine just how long an envelope should be you need to remember that End Limit and Rate are not absolute values corresponding to any unit of measurement. The amount of time it takes to go from one segment to another depends not only on the Rate but on the values for the two End Limits. It seems obvious that if the Rate of a segment is changed, the time needed to play through the segment will change accordingly. But the converse is also true. If either of the End Limits changes and the Rate remains the same, the time it takes to play through the segment will also change.

*An Envelope Tutorial*

## ENVELOPE OPTIONS—A BRIEF TUTORIAL

The Envelope Editor is a sophisticated environment of sub-options in the Instrument Editor dedicated to creating or altering the amplitude envelopes of Instruments. This can be quite an extensive process, since an Instrument may have anywhere from 3 to 256 envelope segments, and each segment has its own settings for type, rate, and end limit, which produce a unique duration of the segment as well.

Selecting INST 29 does two different things, depending on whether or not your Instrument has an envelope already assigned to it. If it does, then INST 29 opens that envelope up for exploration and editing, without changing it. If it doesn't, then INST 29 assigns it a standard amplitude envelope consisting of three segments.

Most of the factory Instruments do not have amplitude envelopes. Bowed Strings Slow does, and the various Sine Waves do, but many of the others have none and will therefore be altered as soon as you enter the Envelope Editor.

NOTE: There is an important distinction to be made here between the envelopes of Instruments and the envelopes that are recorded into some of the Soundfiles. The Kurzwiel Grand Piano, for example, has no Instrument envelope; the attack and decay characteristics you hear when you play it are part of the Soundfiles themselves.

## THE DEFAULT INSTRUMENT ENVELOPE

The parameters for the default envelope activated by INST 29 are:

SEGMENT 1:
LOGARITHMIC ATTACK
END LIMIT 0
RATE 1000

SEGMENT 2:
EXPONENTIAL DECAY
END LIMIT 255
RATE 500

SEGMENT 3:
EXPONENTIAL DECAY
END LIMIT 255
RATE 600

Don't worry if you don't understand all the terms in the listing; they'll be explained in just a moment. In the meantime, we recommend that you actually *listen* to how this sub-option works. Get into the Instrument Editor with Kurzweil Grand Piano as your Keyboard Setup and Grand Piano as your active Instrument, then go to this sub-option—but *don't select it* yet. Instead, play a little while, activate INST 29 and listen to how the sound changes as the standard envelope is laid onto it.

To return your sound to normal, exit from the Instrument Editor by pressing the PLAY button.

## MOVING AMONG THE ENVELOPE SEGMENTS

To cycle from one envelope segment to another, use the left and right arrow keys. The display will show you which segment you are in at any given time—the segments are numbered beginning at 1 (and continuing to 256 if your envelope has that many segments).

## CHANGING SEGMENT TYPES

When you are in the segment you want to edit, cycle among the available segment types by pressing the up and down arrow keys. There are four types:

LOGARITHMIC ATTACK
DELAY SEGMENT
EXPONENTIAL DECAY
EXPONENTIAL GROWTH

When the segment type you want to edit is visible in the display, press SELECT.

By choosing different segment types and setting their end limit and rate parameters, you dictate how loud a sound will get, how long it

will take to reach its loudest point, how long it will linger at that volume, and how long it takes to gradually die away.

It helps to visualize segments as graphs of volume against time.

NOTE: The figures on the next two pages illustrate the way we perceive the various envelope segment types. Exponential Growth and Exponential Decay might better be called "Linear Growth" and "Linear Decay" segments since, as the graphs indicate, these result in a straight line. The reason these *appear* to be a straight line is due to the fact that the *y* axis represents decibels which, themselves are logarithmic units. For the same reason, Logarithmic Attack would normally appear as a straight line on a graph where the *y* axis represents decibels which, themselves are logarithmic units. The reason that it does not resemble the appropriate curve (consistent with our perception) is because it is a logarithmic curve, applied to a logarithmic scale (decibels).

• In a LOGARITHMIC ATTACK segment, the sound gets louder continuously, starting slowly and increasing in speed as it nears its starting point.

• In an EXPONENTIAL GROWTH segment, volume increases at a constant rate.

• In a DELAY segment the volume level is constant over time.

• In an EXPONENTIAL DECAY segment the volume decreases at a constant rate.

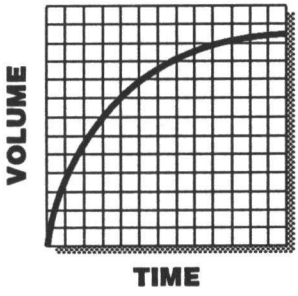
## ADDING SEGMENTS

To extend an envelope, press the INSERT button, and a new segment will be appended to the end of the segment you are currently examining.

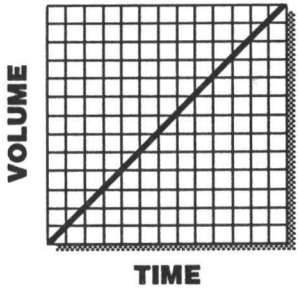
NOTE: This new segment will be an exact copy of the segment that *follows* the one you are examining or editing when you press the INSERT button unless you are adding a segment to follow the current last segment. In th latter case, the new final segment will usually be a copy of the last segment that was in the buffer prior to entering the envelope editor. If you wish, you can alter the values of any added

# *Envelope Segment Types*

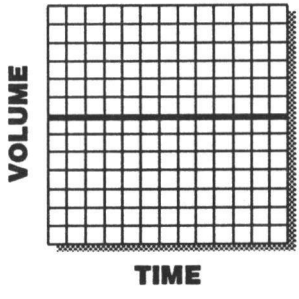
*The best way to understand the various envelope segment types is to form a picture of the envelope in your mind and then listen to it at the keyboard.*



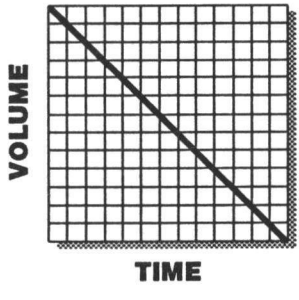

*Logarithmic Attack Segment*




*Exponential Growth Segment*

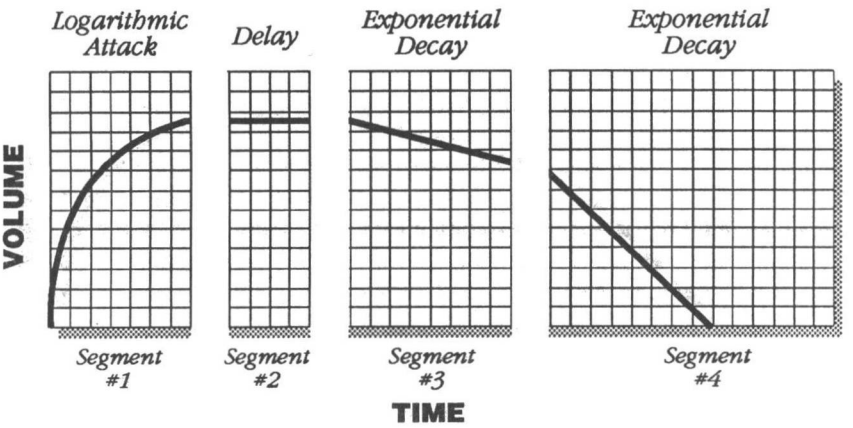



*Delay Segment*

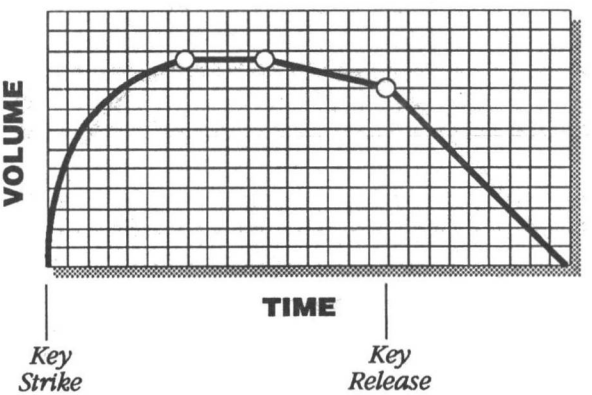



*Exponential Decay Segment*

# A Simple 4-Segment Envelope




*The graphs on this page illustrate how the different segment types come together to create a simple amplitude envelope.*




*When a key is pressed, volume increases to the first segment's END LIMIT, then levels off for a preset amount of time during the DELAY segment. Volume begins to decrease in the third segment; then (because the key is released) the third segment is ended early, and the final segment, which is always used for releases, causes a rapid decay to silence.*

segments to your own preferences.

## REMOVING A SEGMENT

Removing a segment is easy—just press the ERASE button. This will erase the segment *immediately following* the segment you are examining or editing unless you are currently editing or examining the final segment. In this case, pressing the ERASE button will erase the final segment.

NOTE: It's generally a good idea to review all segments of an envelope after erasing or inserting, just to make certain that you didn't accidentally insert a segment in the wrong place, or delete a segment you didn't intend to.

## CHOOSING SEGMENT TYPES

*Here are a few recommendations about when to use the various segment types.*

For realistic fast attacks, your first segment should be a Logarithmic Attack segment. It can also be an Exponential Growth segment, or even a Delay segment. If you do use a Delay segment in the beginning, it must be followed by a Logarithmic Attack segment or an Exponential Growth segment in order for any sound to be heard. This combination allows you to create an Instrument that starts to play when you strike a key, but which doesn't become audible until the Delay Segment has run its preset course and the next segment kicks in.

Put several envelopes beginning with Delay segments together in a Keyboard Setup and you can create staggered timbres, or staggered chords. The effect can be similar to the Full Chorus option in the Chorus Editor but you will have more control over the timing of voice entries. (The only thing to be wary of in this approach is to avoid Keyboard Setups with many layers and, therefore, heavy channel stealing. In that case, notes may be stolen before they have reached audibility in the first place.)

In all cases your last segment must be an Exponential Decay segment with an End Limit of 255, or else you'll end up with notes that play on. It isn't likely that they *actually* will play on forever, since they'll start stacking up and cause channel stealing.

## MULTIPLE DELAY SEGMENTS

There isn't much point in stringing together consecutive Delay segments in an envelope, since a Delay segment has no impact on volume except to set the length of time a given volume level will hold without changing. The range of possible settings is from 0 to 32,000 milliseconds (32 seconds), so only a *very* rare application would require putting two or more Delay segments in order.

On the other hand, an envelope with many Delay segments interspersed throughout it can be quite exciting. Using this technique you can achieve tremolo effects that aren't locked into the rigid regularity of a standard LFO waveform.

## MULTIPLE ATTACKS AND MULTIPLE DECAYS

Stringing together the same kind of Attack segment, or alternating between two different types, but carefully varying Rates and End Limits, gives you a wide variety of effects. For example, you could use a very fast Exponential Growth segment with a high End Limit setting, followed by a slow Exponential Growth segment with a very low End Limit, to create an Instrument that was slow in reaching its full volume but, nevertheless, quick and responsive to your keystrikes. Remember: high End Limits produce low volumes and low End Limits produce high volumes.

Or you could turn it around, using a slow Exponential Growth that seemed to be taking forever to get off the ground, and have it abruptly shoot through the roof as a lightning fast Logarithmic Attack segment took over control.

Similarly, with Exponential Decay, you can get some excellent fade outs and volume drops by stringing several of them together in a line and properly juggling their End Limits and Rates.

## THE RELEASE SEGMENT

If you lift your fingers from the Keyboard before your envelope has reached its conclusion, it will automatically leap ahead to its last

segment. This allows you to create envelopes with a release that responds to how you play, or envelopes that release in the same manner no matter what tempo you are playing at. The standard default envelope imposed by INST 29 is a good example. If you look at it you will see that its second segment has an End Limit of 255, which represents total silence. But so does its third segment. Why is this so?

*Looking at envelopes that you like (going in and checking out the numbers) is a great way to learn how the Envelope Editor works.*

The answer is simple. If you hit a key and hold it you will hear segments 1 and 2, after which the note ends. If you hit a key and release your finger before segment 1 has ended, the envelope leaps ahead to segment 3—the release. Therefore, you have an envelope that ends differently depending on whether you hold the notes down or not.

With room for up to 256 segments in an envelope, you have a lot of variations available. You can rely on being able to get the release effect you want.

## CHANGING SEGMENT VOLUMES

After you've chosen a segment's type, the display will change to show that segment's current End Limit. This is a number that determines how loud a segment will be when it reaches its end. The possible range is from 0 (loudest) to 255 (total silence). The End Limit is a measure of attenuation in Bodonys. (NOTE: The Bodony is a convenient unit of attenuation. It was named in honor of Lawrence Bodony, a major contributor to the design of the 250. One Bodony equals 1/3 decibel.) You may choose a new setting using the numeric keypad or the VALUE slider, followed by Select.

*Remember, the End Limit is a measure of attenuation.*

Delay Segments derive their volume level entirely from the End Limit of the segment immediately before them in the envelope. They completely ignore whatever End Limit setting you give them, so just SELECT on through to setting their Rates, which *are* important.

NOTE: Setting an End Limit of 255 cuts off sound completely. Additional segments tacked on after one with an End Limit of 255 have no effect. All End Limit settings represent the volume you'll get at *maximum* keystrike velocity. Therefore, playing at less than maximum velocity will get you a softer, more attenuated sound. To the 250, this is represented by a higher End Limit level than the one you set. (Remember that we are dealing in attenuation here, not amplification, so

higher numbers represent quieter sounds.)

The danger is that you might set an End Limit for a segment that is too close to 255 (no volume), so that a soft keystrike plays below that crucial No Volume cutoff line—at which point the note will vanish completely, no matter how many more segments its amplitude envelope contains. For most musical purposes, you should be careful to keep all of your envelope segments except your final one (or ones) below 200, or else notes might drop out when you play softly.

On the other hand, you might deliberately build an envelope with a high End Limit in the middle, so that by playing softly you get one kind of effect (as the envelope reaches its mid-point and cuts off) and by playing harder (thereby lifting signal strength above the cutoff point) you bring in a whole new and much more complex envelope.

## CHANGING SEGMENT RATES

After selecting an End Limit, the display changes to show the segment's current Rate. The range of this setting can be anything from 1 to 32,767. The higher the number, the faster the Rate (just like the numbers on a car's speedometer). For example, an attack Rate of 10,000 would be quite fast, an attack Rate of 40 would be quite slow, and an attack Rate of 0 wouldn't be an attack Rate at all—it wouldn't even begin.

NOTE: In a Logarithmic Attack, the 250 calculates a new step value for an envelope segment once every millisecond, and then, using the new step value, adjusts the sound's amplitude to conform to the curve of the envelope segment (see the illustration of a Logarithmic Attack segment). The current step value is calculated by adding a fixed number to the previously calculated step value. This fixed number is called the Rate.

If you are making settings for a Delay Segment, the Rate sets not speed, but time (in milliseconds). For example, setting a Rate of 10,000 for a Delay Segment is the same as telling an envelope to "stay at the current volume for 10 seconds." For the other three segment types the effect of the Rate setting is a little more complex as described in the following section.

## RATES HIGHER THAN 32,767

With any Rate setting it is possible to enter numbers higher than 32,767—in fact, you may enter numbers as high as 65,535. Doing so will cause the display to show negative numbers. In general the higher numbers act exactly like you would expect them to although unpredictable results may occur from time to time. Entering a Rate of 65,535 will cause the display to read -1; 65,634 will cause the display to read -2; and 65,533 will cause the display to read -3, and so forth.

Thus, if you enter a Rate of 65,535 for a Delay Segment (Rate is equal to time in milliseconds in this case) the display will read -1 but the Delay Segment will actually be 65,535 milliseconds in length (i.e. 65.5 seconds), which is just what you'd expect. For other types of segments, the relationship can become a bit more confusing.

## THE RELATIONSHIP OF RATE TO END LIMIT

In a Delay Segment, Rate corresponds to time (in milliseconds) and by now, you are probably used to setting values in milliseconds for other parameters as well (such as the Chorus, Vibrato, and Tremolo settings, etc.). It is only natural to make the assumption that this holds true with the other three types of envelope segments. If you remember that you are setting Rate and not duration you will understand why this is not the case. Consider a commonplace analogy: When you are driving an automobile at a rate of 55 MPH, you still will not know how long it will take to get from one place to another unless you also know the exact distance you will be traveling. It is the same case in the Envelope Editor. Specifying a Rate in the Envelope Editor defines the speed at which you will move from one End Limit to another, and the "distance" between the two End Limits will affect how long (in time) it takes to get from one End Limit to the next. Thus, at a Rate of 1,000 it will take less time to go from 0 to an End Limit of 200 than it will to "travel" from an End Limit of 125 to and End Limit of 245. You see that the actual duration is determined by both Rate and End Limit. The following three principles illustrate how this works.

•DELAY SEGMENTS
Actual duration = RATE = time (in milliseconds)
(END LIMIT has no effect).

Example: a RATE of 19500 = 19500 milliseconds (19.5 seconds) duration

LOGARITHMIC ATTACK SEGMENTS
Actual duration (at End Limit = 1) = 60 (seconds) divided by RATE

Example: a RATE of 4 = 15 seconds, 4000 = .015 seconds duration.

EXPONENTIAL GROWTH SEGMENTS
Actual duration = (255 minus End Limit) time 8192 divided by RATE

Example: RATE of 800, End Limit of 5 = 2560 milliseconds (2.56 secs.)

EXPONENTIAL DECAY SEGMENTS
Actual duration = End Limit times 8192 divided by RATE

Example: RATE of 800, End Limit of 250 = 2560 msecs. (2.56 secs.)

## IMPORT INST ENVELOPE (INST 30)

*This is a great way to try out the same envelope on different sounds.*

Pressing the SELECT button when this item is in the display allows you to take an amplitude envelope from one Instrument and apply it to the current Instrument. The 250 will prompt you for the number of the Instrument from which you want to import a new Instrument envelope. Use the arrow keys to scroll through the list of available Instruments. After selecting an Instrument you will then be asked whether you want to import the Instrument envelope from the selected Instrument. Pressing the YES button applies the selected Instrument's envelope to the current Instrument. Pressing the NO button cancels the operation.

## TOGGLE INST ENVELOPE (INST 31)

Pressing the SELECT button when this item is in the display allows you to hear the current Instrument without its amplitude envelope. Pressing the SELECT button toggles the Instrument envelope on and off giving you the opportunity to make an instant A-B comparison between the Instrument with its current envelope settings enabled or

disabled.

## SET BRIGHTNESS LEVEL (INST 32)

Pressing the SELECT button when this item is in the display allows you to set the brightness level for the current Instrument. Use the VALUE slider or the numeric keypad to enter the brightness level. For a complete discussion of brightness level see the section on Brightness in the chapter on the Function Editor.

## SET BRIGHTNESS THRESH (INST 33)

Pressing the SELECT button when this item is in the display allows you to set the brightness threshold for the current Instrument. Use the VALUE slider or the numeric keypad to enter the brightness threshold. For a complete discussion of brightness threshold see the section on Brightness in the chapter on the Function Editor.

## BRIGHT DYNAMIC RANGE (INST 34)

Pressing the SELECT button when this item is in the display allows you to set the brightness dynamic range for the current Instrument. Use the VALUE slider or the numeric keypad to enter the brightness dynamic range. For a complete discussion of brightness dynamic range see the section on Brightness in the chapter on the Function Editor.

## ALIASING ON/OFF (INST 35)

Pressing the SELECT button when this item is in the display allows you to turn aliasing on or off. Use the left and right arrow keys to toggle aliasing on or off. For a complete discussion of aliasing see the section on Brightness in the chapter on the Function Editor.

## SET EFFECTS FLAGS (INST 36)

Pressing the SELECT button when this item is in the display allows you to set a variety of effects flags. The 250 will automatically scroll

through the list of effects flags as you decide whether or not to set each one by pressing the YES or NO buttons.

The first four flags determine whether you want the current Instrument to use the local or global settings for vibrato, tremolo, chorus, and brightness. Choose YES for local, NO for global. The local settings are the individual settings of these options that you set for the current Instrument from within the Instrument Editor. The global settings are the settings of these options that you set for the whole 250 in the Function and Play Editors.

The next two flags determine whether you want the current Instrument to ignore pitch bend and sustain pedal. These are self-explanatory. If an Instrument is set to ignore pitch bend and/or sustain pedal using the pitch bend wheel and sustain pedal will have no effect on the sound of this Instrument.

### SET TO DEFAULTS (INST 37)

Pressing the SELECT button when this item is in the display causes the 250 to ask you whether you want to set all parameters in the current Instrument to their default values. Pressing the YES button sets all parameters to their default values. Pressing the NO button cancels the operation.

### COMPARE W/ ORIGINAL INST (INST 38)

Pressing the SELECT button when this item is in the display allows you to compare the edited Instrument with its original un-edited version.

### SET SUSTAIN DECAY RATE (INST 39)

Pressing the SELECT button when this item is in the display allows you to set an alternate release that comes into effect whenever the sustain pedal is depressed. The 250 will prompt you for the value of the sustain decay rate. Use the VALUE slider or the numeric keypad to enter a number.

## SET MONO/POLY MODES (INST 40)

Pressing the SELECT button when this item is in the display allows you to determine whether the current Instrument responds monophonically or polyphonically. Polyphonic mode is the normal mode of operation for all Instruments—each Instrument responds polyphonically playing all notes up to the 12 voice limit. When an Instrument is placed in monophonic mode it will play only one note at a time. If you decide to set the current Instrument into monophonic mode you have four choices for determining which note will sound if more than one note is being played. The choices are:

| | |
|---|---|
| HIGHEST NOTE | 1 |
| LOWEST NOTE | 2 |
| FIRST NOTE | 3 |
| LAST NOTE | 4 |

If you choose HIGHEST NOTE and more than one note is played, only the highest note played will sound. If you choose LOWEST NOTE and more than one note is played, only the lowest note played will sound. If you choose FIRST NOTE and more than one note is played, only the first note will sound. If you choose LAST NOTE and more than one note is played only the last note played will sound.

## SET IGNORE RELEASE (INST 41)

*Use this option on percussion sounds.*

Pressing the SELECT button when this item is in the display allows you to determine whether the current Instrument will ignore key releases. If you want the current Instrument to ignore key releases press the YES button. If you do not want the current Instrument to ignore key releases press the NO button. Setting an Instrument to ignore key releases means that it will always play through its assigned amplitude envelope even after you lift your finger from the key. It is primarily used with percussion sounds. On sustaining sounds (strings, woodwinds, brass, etc...) use this option with care. Setting an Instrument like BOWED STRINGS FAST (which is a looped sound) to ignore key releases would make it play forever.

## SET SOURCE KEYBOARD (INST 42)

Pressing the SELECT button when this item is in the display allows you to keep an Instrument and a Soundfile together when you use an Instrument for splitting and layering. The 250 will prompt you for the number of the Source Keyboard from which you want to take the new Soundfile.

Use this menu item when you're using an Instrument (as opposed to a Keyboard) for splitting or layering. If you have a particular Instrument effect that you like to use with a particular Soundfile, you'll want to use SET SOURCE KEYBOARD to keep the Instrument and the Soundfile together when you split or layer by Instrument rather than by Keyboard. The Source Keyboard tells the Keyboard Editor which Soundfile is associated with the Instrument you're manipulating.

## SAVE INST (INST 43)

Pressing the SELECT button when this item is in the display allows you to save the current Instrument to the 250's Instrument memory. Before saving, the 250 will display the number of the current Instrument and give you a chance to change it if you want. You must use the numeric keypad to change the number of your Instrument. Once the number is chosen, pressing the SELECT button twice causes the 250 to prompt you to name the Instrument and then save it.

## ERASE INST (INST 44)

Pressing the SELECT button when this item is in the display allows you to erase the current Instrument. The 250 will ask you if you want to erase the current Instrument. Pressing the YES button will erase the current Instrument. Pressing the NO button will cancel the operation.

## ERASE ALL INSTS (INST 45)

*Don't worry about wiping out those great Kurzweil ROM sounds—they can't be deleted.*

Pressing the SELECT button when this item is in the display allows you to erase all Instruments from memory. When you choose this option you'll be asked: **DO YOU REALLY WANT TO ERASE ALL INSTRUMENTS???** Pressing the YES button will erase all Instruments from the

Instrument memory. Pressing the NO button will cancel the operation. Only user Instruments can be erased from memory.

## RENAME INST (INST 46)

Pressing the SELECT button when this item is in the display allows you to rename Instruments. The 250 will prompt you for the number of the Instrument you want to save. When you've entered the number and pressed the SELECT button twice you can give your Instrument a new name by using the ALPHA slider to scroll through the list of available characters and then hitting the ALPHA button to move to the next character in the name. If you make a mistake hit the red "R" button (Reset) to back up one character at a time.

## SHUFFLE INST LIST (INST 47)

Pressing the SELECT button when this item is in the display allows you to shuffle or swap the Instruments in the 250 Instrument memory. If you have many Instruments in memory you may want to reorder them. That's what this item does. The 250 lets you move Instruments in the Instrument memory by swapping one Instrument with another. You will first be prompted for the number of the first Instrument to be swapped. You'll then be prompted for the number of the second Instrument to be swapped. When you've entered numbers for both Instruments pressing the SELECT button swaps the two Instruments in memory by exchanging their Instrument numbers.

## SHOW INST FREE SPACE (INST 48)

Pressing the SELECT button when this item is in the display causes the 250 to display the available free space, the amount of memory left for the creation of new user Instruments.

## GETTING AROUND WITH THE FRONT PANEL BUTTONS

In several of the editors it is possible to go directly to a particular menu item by pressing the appropriate front panel button. The button assignments for the Instrument Editor are listed below. Learning the buttons

and their assignments in each of the editors can help you to move around more efficiently.

## INSTRUMENT EDITOR BUTTON ASSIGNMENTS

| Pressing This Button | Takes You to This Item |
|---|---|
| SLIDER SELECT #1 | SET MIN ATTENUATION? (INST 11) |
| SLIDER SELECT #2 | REMOVE/ADD TOUCH SENSE? (INST13) |
| SLIDER SELECT #3 | SET VELOCITY TRACKING? (INST 14) |
| ALPHA | RENAME INST? (INST 46) |
| VALUE | SET SUSTAIN DECAY RATE? (INST 39) |
| DETUNE | SET IGNORE RELEASE? (INST 41) |
| LEFT PEDAL | SET BRIGHTNESS THRESH? (INST 33) |
| EXTERNAL PEDAL | BRIGHT DYNAMIC RANGE? (INST 34) |
| RIGHT PEDAL | ALIASING ON/OFF? (INST 35) |
| LEFT LEVER | SET CHORUS DETUNE? (INST 17) |
| RIGHT LEVER | SET CHORUS DELAY? (INST 18) |
| CHORUS | SET CHORUS TYPE? (INST 16) |
| LEVEL | SET BRIGHTNESS LEVEL? (INST 32) |
| TRANSPOSE UP | SET TREMOLO CURVE TYPE? (INST 24) |
| TRANSPOSE DOWN | SET VIBRATO CURVE TYPE? (INST 19) |
| KEYBOARD | CHANGE CURRENT KBD? (INST 15) |
| "R" | SET TO DEFAULTS? (INST 37) |
| INSTRUMENT | IMPORT INST ENVELOPE? (INST 30) |
| SEQUENCE | SET EFFECTS FLAGS? (INST 36) |
| RECORD | CAPTURE EFFECT SETTINGS? (INST 9) |
| CONTINUE | SET OUTPUT GROUP? (INST 10) |
| LOOP | COMPARE W/ORIG. INST.? (INST 38) |
| TEMPO UP | SET TREMOLO DEPTH? (INST 25) |
| TEMPO DOWN | SET VIBRATO DEPTH? (INST 20) |
| EDIT | CREATE/MODIFY ENVELOPE? (INST 29) |
| SEARCH | SHOW INST FREE SPACE? (INST 48) |
| SAVE | SAVE INST? (INST 43) |
| ERASE | ERASE INST? (INST 44) |
| SET POINTER | SET VIBRATO RATE? (INST 21) |
| INSERT | SET TREMOLO RATE? (INST 26) |
| LIST | SHUFFLE INST LIST? (INST 47) |
| MIDI | SET SOURCE KEYBOARD? (INST 42) |
| SYNC | SET MONO/POLY MODES? (INST 40) |
| READ | SET VIBRATO DELAY? (INST 22) |
| SEND | SET TREMOLO DELAY? (INST 27) |

# The MIDI Editor

# 7

Chapter Seven

# *The MIDI Editor*

## *Overview*

### DESCRIPTION

The MIDI Editor allows you to define the way the 250 behaves as a MIDI device. In Play Mode, MIDI can be disabled entirely. But if MIDI is enabled you will want a way of defining the way the 250 commnicates with other MIDI devices in your set up.

In the MIDI Editor you can establish the 250's MIDI basic channel and MIDI mode. You can also set the assignments of the 250's assignable controllers so that they can respond over MIDI. You can enable the transmission and reception of MIDI program changes. And you can program the 250 to respond differently on each MIDI channel.

The 250 is a tremendous MIDI instrument. Its MIDI implementation is powerful and complete. The 250 can serve both as a multi-timbral sound module and as a MIDI master controller as well.

## *Main Menus*

### RECEIVE OPTIONS (MIDI 1)

The menu choices under RECEIVE OPTIONS (MIDI 1) perform operations such as setting the 250's MIDI receive mode (MIDI 6), assigning MIDI controllers to front panel controls (MIDI 7), enabling MIDI program changes from external sources (MIDI 8), receiving Local Control and All Notes Off (MIDI 9 and MIDI 10), and assigning MIDI

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